AMERICAN
JOURNAL OF SURGERY

VOL. XXXIII. MARCH, 1919 No. 3

SLIDING HERNIA: WITH REPORT OF TWO CASES INVOLVING THE URINARY BLADDER.

LOUIS FRANK, M.D., F.A.C.S.
LOUISVILLE, KENTUCKY.

A comprehensive discussion of sliding hernia of the urinary bladder must necessarily include other types of sliding hernia, because the pathology in each is practically identical; in lesser degree it must also embrace consideration of hernia in which a portion of the bladder occupies the true hernial sac, although the sliding process may form no part of the existing pathology. It seems pertinent to remark at the outset that few instances of sliding vesical hernia have been recorded.

In this paper I shall purposely omit discussion of details concerning the presumed etiologic factors primarily responsible for the production of the various types of sliding hernia. It is admitted that at best the etiology is uncertain and existing information therefore indefinite, although the secondary mechanical factors and their results are fairly well understood.

Vesical Hernia: So far as can be ascertained from a study of the literature, the first accurate description of hernial extrusion of the bladder must be accredited to Albucasis, who lived and practiced in the eleventh century, A. D.; the subject is later rather extensively discussed by Sala, de Chauliac, and many other surgical writers. However, to the classic monograph by Verdier published in 1769 we are indebted for the majority of the early anatomic and pathologic data concerning this particular type of hernia. In his book written in 1804 Sir Astley Cooper mentions only four instances of vesical hernia, two observed in living subjects and two at necropsy. Probably because of its rarity this type of hernia is practically ignored by most modern writers. Of four thousand two hundred and eighty-five herniotomies performed in one of the largest American hospitals, a portion of the bladder was found in the hernial sac in only eight instances.

There are recognized three varieties of vesical hernia, viz., (a) the extra-peritoneal, where a portion of the viscus protrudes alongside the sac of an ordinary hernia, or rarely independent of any hernial sac, (b) the intra-peritoneal, where a portion of the viscus appears in the sac covered with peritoneum, and (c) the para-peritoneal, where a portion of the viscus only is covered with peritoneum of the sac. In their classification and description of cystocele, in its relation to the various types of hernia, the following division is made by some of the older writers on the subject: (a) cystocele inguinalis, (b) c. abdominalis, (c) c. cruralis, (d) c. foraminæ obturatoriæ, (e) c. perineal, and (f) c. vaginalis.

Vesical hernia, whether sliding or otherwise, occurs with greater frequency in males than in females, in the proportion of about four to one. It is almost invariably encountered in inguinal hernia of the former and in femoral hernia of the latter. However, there have been some notable exceptions to this rule, as it has been occasionally observed in the herniæ of children of both sexes. The majority of instances recorded have been in middle-aged or elderly males the subjects of either direct or indirect inguinal herniæ.

Moschcowitz remarks that owing to its proximity to the inguinal region the bladder is frequently (one to three per cent.) found in oblique inguinal hernia, either alone or accompanied by other viscera; and for similar reason it is found more frequently in direct than in indirect inguinal herniæ. It must be remembered that the bladder is invested by peritoneum only on its posterior surface and vertex, and traction upon the sac of an inguinal hernia may cause the viscus to be extruded; but "this dislocation is merely an artefact, and cannot be called a hernia of the bladder in the proper sense of the word,—a hernia of the bladder is one in which the bladder forms part or the whole of the hernial contents."

Sliding Hernia: By the designation sliding hernia" or the so-called *hernia par glissement* of the French, is meant a hernia in which a portion or all of some of the slightly mobile pelvic viscera slide downward through the opening into the hernial sac, with or without intestine or omentum, the sliding organ necessarily being incompletely enclosed by peritoneum. It seems worthy of note, in this connection, that no viscus having a complete peritoneal investment can become the sliding part of a hernia. The sliding type is an ex-

ceedingly infrequent form of hernia regardless of what may be the sliding viscus; and the rarest form of all is sliding hernia of the bladder.

Sliding herniæ involving any of the pelvic viscera are, comparatively speaking, very uncommon. In a series of over five hundred herniotomies mentioned by Kirschner in 1911 the type was said to be "sliding" in fifteen instances. The author states that of these "ten were sliding herniæ of the sigmoid, and five were sliding herniæ of the cecum; all the cases occurred in adult male patients; in one case the sliding hernia was through the femoral ring, there being also present a right and a left inguinal hernia; in eight cases there were double inguinal herniæ, and in two instances these were complicated by femoral herniæ; undescended testicle was encountered once and hydrocele four times."

It is interesting to note Kirschner states that the sigmoid and cecum were the sliding viscera in the fifteen cases of sliding herniæ cited. While I do not wish to indulge in criticism nor in disputation, as already suggested, it is impossible of understanding how any viscus completely invested by peritoneum can become the sliding portion of a hernia; and it will be remembered that the small intestine, the sigmoid, the transverse colon and the cecum are entirely covered by the peritoneum or its reflections. Of course, where for some unknown reason these viscera become divested of peritoneum, or where because of anatomic defect they were originally not invested by the peritoneum or its reflections, the possibility of their becoming the sliding parts of herniæ is unquestioned. However, instances of that character must be so rare that when observed they may be regarded merely as anatomic curiosities; no such cases have been recorded in the literature so far as I am informed. Certain writers on the subject, in my opinion, have been prone to speak of the sigmoid and other portions of the large intestine without proper discrimination, or have been entirely mistaken in their anatomic division. Moschcowitz observes that "it becomes evident that only those parts of the large intestine can be involved in a sliding hernia which are not covered on all sides by peritoneum. It is manifest, therefore, in spite of assertions to the contrary, that the ascending and descending colon are the only parts of the large intestine which can enter into the composition of a sliding hernia. Most authors speak of the sigmoid flexure as the sliding organ, but this is manifestly incorrect."

The pathogenesis of the various types of sliding hernia as given by Moschcowitz may be worthy of interpolation in abstract form: He admits the difficulty of giving a short description of the phenomenon.

(1) Imagine that the peritoneal attachments of the descending colon have become loosened from the subjacent structures so that instead of being a fixed structure it moves easily on its bed, and the peritoneum about the internal inguinal ring is pulled downward; a hernial sac is thus formed and eventually the sigmoid flexure and descending colon will be pulled downward, the latter forming a part of the posterior surface of the sac. This may be termed a "sliding hernia by pulling."

(2) Imagine that the descending colon has been loosened as described and that pressure has been exerted just above its junction with the sigmoid flexure; the direction of this force must first be

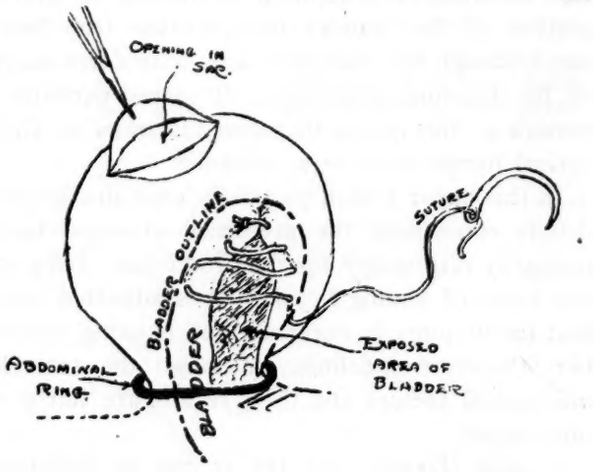

Fig. 1.

backward, then downward and inward, toward the internal inguinal ring; the anterior wall of the descending colon is thus approximated to the posterior wall which is pushed nearer the internal inguinal ring and finally outward behind the peritoneum into the inguinal canal, thus producing a true hernia without involvement of the peritoneum, *i. e.*, a sacless hernia; in contradistinction to the first variety mentioned, this may be termed a "sliding hernia by pushing."

The author states that both types occur with about equal frequency, but they differ in several respects; *e. g.*, herniæ by pulling are usually very large; herniæ by pushing are very small; herniæ by pulling usually have a large sac; herniæ by pushing have no sac; in the herniæ by pulling the intestinal nutrient vessels are usually pulled downward; in the herniæ by pushing the nutrient vessels need not necessarily be in the hernia.

In general, says the author, the broader the uncovered area of a viscus (by peritoneum) the greater the likelihood of its constituting the slid-

ing part of a sliding hernia; and therefore on theoretical grounds one may divide the abdominal organs, according to their likelihood of entering into the formation of a sliding hernia, into the following groups:

Always.—Ureter.

Never.—Ovary, stomach, liver, spleen, transverse colon, cecum, omentum.

Rarely.—Sigmoid flexure, small intestine, uterus, fallopian tube.

Likely.—Ascending colon, descending colon, broad ligament, urinary bladder, appendix.

"Finally, I wish to state that, by the above description, I refer only to the sliding organ, which has nothing to do with the hernia. In other words, we may have combinations; thus, for instance, there is nothing to prevent the ovary from being in a sliding hernia of the descending colon; in such a hernia the ovary is merely an accidental inhabitant

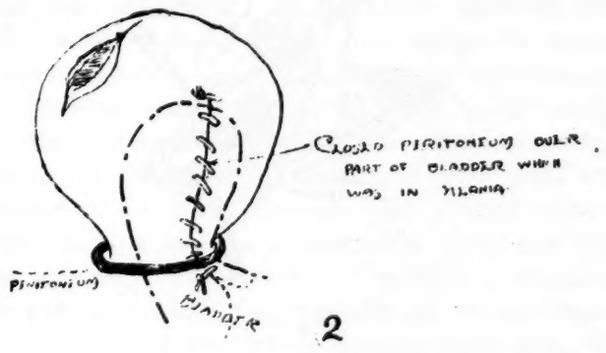

Fig. 2.

of the hernia, but only the descending colon is the sliding part. Assuming the correctness of this pathogenesis of sliding hernia, it becomes self-evident that the terms hernia of the large intestine, and sliding hernia, are by no means synonymous. This mistake is only too frequently made in medical literature" (Moschcowitz).

In summarizing the varieties of sliding herniæ the author pertinently remarks:

(a) Cecum: The cecum has a complete peritoneal investment and can therefore never be the sliding part of a sliding hernia; it is merely prolapsed into the hernial sac. (This does not refer to the *hernie par bascule* of the French.)

(b) Ascending colon: The ascending colon is found in inguinal hernia almost without exception as the sliding viscus; in large herniæ the pathogenesis is explained by a "pulling" mechanism the ascending colon being frequently accompanied by other viscera,—cecum, appendix, small intestine, omentum; in small herniæ the pathogenesis may be explained by a "pushing" mechanism and may be entirely devoid of a sac.

(c) Transverse colon: The transverse colon has a complete peritoneal investment and is therefore never the sliding portion of a sliding hernia.

(d) Descending colon: With slight modifications the remarks on herniæ of the ascending colon apply equally to those of the descending colon.

(e) Sigmoid flexure: Most writers speak of herniæ of the sigmoid flexure as a "type example" of sliding hernia; obviously the sigmoid (excepting under unusual conditions) cannot form the sliding part of a sliding hernia.

Sliding Vesical Hernia: As already intimated, the rarest type of sliding hernia is that in which the bladder constitutes the sliding viscus; in fact, it is so infrequently observed that many authors

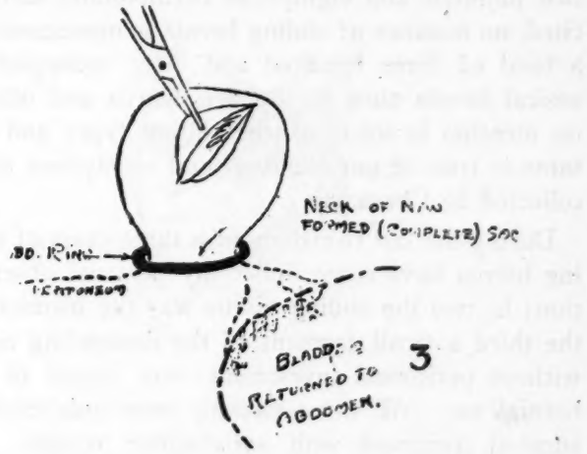

Fig. 3.

doubt the existence of such an entity, and therefore ignore the subject entirely. One of Sir Astley Cooper's cases (1804) was undoubtedly a sliding vesical hernia which was unrecognized, as will be noted from his description reproduced verbatim: "When the cavity of this hernial sac was laid open by incision, both omentum and intestine presented themselves; the bag in which they were contained was complete, and the bladder was still concealed. I then threw air in by the urethra in order to inflate the bladder; and immediately the bladder began to swell, not only in the pelvis but also in the the scrotum behind the hernial sac, until it became as large nearly as an ostrich's egg. The bladder was situated behind the peritoneal sac, to the posterior part of which the anterior surface of the viscus closely adhered; posteriorly it was connected by cellular membrane to the scrotum and to the tunica vaginalis of the cord. On tracing it upward it was found to ascend through the external abdominal ring into the inguinal canal, where it maintained

the same relative situation to the cremaster and spermatic vessels as in the scrotum; it thence descended through the internal abdominal ring into the pelvis. It is almost needless to observe that both rings, especially the inner ring, were much dilated."

This is the first comprehensive description of sliding vesical hernia which I have been able to locate in the literature, although the exact nature of the pathology escaped the recognition of this astute and careful observer.

The comparative frequency of sliding vesical hernia cannot be even approximately estimated. In Kirschner's fifteen cases of sliding hernia noted in a series of over five hundred herniotomies the bladder is not mentioned as the sliding viscus; in the eight cases of vesical protrusion in four thousand two hundred and eighty-five herniotomies already cited, no instance of sliding hernia is mentioned; in a total of three hundred and fifty examples of vesical hernia cited by Bruner, Curtis and others, no mention is made of the sliding type; and the same is true of one hundred and ninety-two cases collected by Cheesman.

During the last twelve months three cases of sliding hernia have come under my personal observation; in two the sliding viscus was the bladder, in the third a small segment of the descending colon without peritoneal investment was found in the hernial sac. All three patients were subjected to surgical treatment with satisfactory results. No other cases of sliding vesical hernia have been encountered in my surgical experience extending over a period of more than twenty-five years. The details concerning these two cases will be reported herein.

Diagnosis and Treatment: It is regretfully admitted that, because of lack of characteristic symptomatology, accurate ante-operative diagnosis of sliding hernia, regardless of what may be the sliding viscus, is sometimes impossible of accomplishment even by the most competent and experienced clinician; and in consequence serious accidents have happened during surgical treatment. The sliding viscus may remain unrecognized or be mistaken for the hernial sac and incised, thus inducing a fatal termination from hemorrhage and peritonitis; it has even been included in the ligature and excised during herniotomy, with a similar result.

The observation seems important, in this connection, that strangulation of the sliding viscus is impossible, although the other hernial contents frequently become strangulated as occurred in one of my cases. This is not difficult of understanding when one studies the formation of sliding hernia and the relation which the ring bears to the blood supply of the sliding portion of the sac contents. Reduction of the sliding viscus by external manipulations is a physical impossibility, and mechanical treatment is of no avail. Thus under the erroneous diagnosis of simple hernia much damage has been done by the application of a truss in sliding hernia involving the intestine as well as the urinary bladder.

Strange as it may appear the diagnosis of sliding hernia may be difficult even after the overlying tissues have been incised, and this applies with equal force whether the sliding viscus be a portion of the intestine or the urinary bladder. The topography may be so changed as a result of the existing pathology that recognition of the various tissues may be exceedingly difficult; the intestine or vesical wall

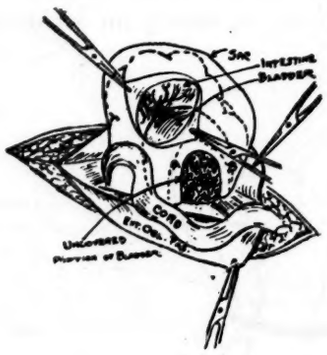

Fig. 4.

may be mistaken for the true hernial sac; likewise the bladder may be mistaken for the intestine, and vice versa; the prevesical fat may closely resemble omentum. "Vesical protrusion has been mistaken for the true hernial sac, for a lipoma, for pro-peritoneal fat, for omentum, for a cyst, for a sacculation of the colon, and also for a second hernial sac."

In a large proportion of the recorded examples of vesical hernia the viscus remained unrecognized until inadvertently incised during the operative steps. In the one hundred and ninety-two cases cited by Cheesman the vesical wall was recognized and avoided during operation in only forty-seven; in ninety-three it was injured "chiefly unintentionally!" In forty-nine cases mentioned by Finisterer the viscus was incised during operation in seventeen; in twenty-seven cases cited by Mandry the viscus was unrecognized and injured in twenty. In none of the eight cases previously referred to was a correct ante-operative diagnosis made, but the viscus was recognized during operation in every instance excepting one femoral hernia; in that case

the bladder was extra-peritoneal, in the other seven it was para- or intra-peritoneal.

In Cheesman's collection of one hundred and ninety-two cases vesical symptoms were noted in only thirty. He suggests that the most constant and indicative clinical sign is a hernial tumor which subsides after micturition; pressure upon the protrusion may cause a desire to urinate, or even the expulsion of urine from the urethra. On the contrary, however, the majority of authors agree that there are no definitely characteristic symptoms, nor does the presence of the vesical hernia, *per se*, induce any serious discomfort to the patient. Where vesical extrusion occurs secondarily, *i. e.*, after primary herniotomy, the diagnosis should not be difficult as more than likely the hernial sac contains only the bladder.

With the idea that greater diagnostic accuracy might be thus insured, the administration of methylene blue for a few days prior to every herniotomy has been suggested. Unfortunately, however, this plan would probably prove futile unless the vesical wall happened to be incised during the operation, in which event escaping urine would be readily recognizable without the admixture of coloring matter. Moreover, to detect the discolored urine with any degree of certainty through the normal vesical muscularis would seem impossible under any circumstances. "Particularly is it prudent in relapsing herniæ to consider the possibility of vesical implication; should the hernia remain irreducible, its gradual increase and disappearance with filling and emptying of the bladder, would tend to confirm the diagnosis; under such circumstances filling the bladder with fluid and allowing it to empty, would remove all doubt" (Ostrom).

According to Roberts, vesical extrusion may be suspected if the hernial sac contains an unusual quantity of fat, if definite muscle fibers are recognized, or if difficulty is encountered in locating the neck of the true hernial sac. If the extrusion is considerable, the veins may be recognized after removal of the prevesical fat, and the introduction of a urethral sound or catheter will verify the diagnosis. The herniated portion will usually be found to the inner side or posterior to the true hernial sac, and not intimately connected with the spermatic cord. The pedicle may be traced downward behind the symphysis into the pelvis, whereas the pedicle of the hernial sac extends upward and backward. Detection of an additional mass to the inner side of the true hernial sac, the muscular character and smaller size of its pedicle, the presence of an inordinate amount of fat, fluctuation of the protruded portion and its color, are the most indicative diagnostic features. However, without exercising the precaution of introducing a catheter or sound, the diagnosis will usually not be perfected until the viscus is incised and the escape of urine noted. In some instances separation of existing adhesions may be impossible without vesical damage. The escape of a small quantity of urine need occasion no alarm, as it will not prejudice healing to any appreciable degree nor seriously militate against the ultimate favorable outcome, provided infection can be prevented and if drainage be practiced for a sufficient length of time (Roberts).

The foregoing remarks apply particularly to the diagnosis and treatment of vesical hernia, rather than the intestinal type, about which nothing further need be said. The following data are abstracted from the classic article by Moschcowitz already mentioned: The main point about herniæ of the bladder is the need to be constantly on the lookout for their presence. If there is an intraperitoneal bladder hernia, the prolapsed portion may be readily reduced. In para-peritoneal hernia it is well to remember that part of the sac is formed by the area of the bladder wall which is covered by peritoneum. In extra-peritoneal hernia of the bladder there is no sac to be ligated; it is merely necessary to be certain the case is not of the para-peritoneal type. Where a diverticulum of the bladder is encountered resection may be indicated. In operating for vesical hernia the peritoneum is carefully dissected from the bladder until that point is reached at which it appears the application of a ligature will leave no peritoneal diverticulum behind. Care is necessary in executing this step that the bladder be not injured. "The stripping off of the peritoneum from the bladder should be continued until the obliterated hypogastric artery, which can be readily recognized by its cord-like feel, is encountered." In any case the bladder after be-

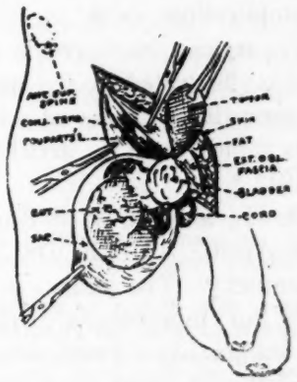

Fig. 5.

ing separated is pushed backward and held out of the way while the deep sutures are being tied.

The problem of dealing with sliding vesical herniæ is by no means simple, and unless one is prepared to cope with such a contingency considerable damage may be inflicted. Not infrequently the ureter has been divided before the nature of the pathology was recognized; and as already shown the vesical wall has been incised in the majority of the recorded cases during the operation. It seems probable that in certain instances where urinary fistulæ have developed following herniotomy a sliding vesical hernia was present and injury occurred because the nature of the pathology remained unrecognized. Such results naturally suggest that the greatest caution should be exercised in dissection and separation of adhesions in the performance of herniotomy, where it is even suspected that vesical complications exist.

The operative technic employed in the two cases to be reported is illustrated by the drawings which are herewith reproduced, some of which are original and others copied from the article of Kirschner published in 1911.*

CASE 1. D. H., a male, aged thirty-eight, was referred to me April 7, 1918, by Dr. N. S. Howard of Harlan, Kentucky. The patient gave a negative family history for tuberculosis, Bright's disease, diabetes, and malignancy. Previous history: usual diseases of childhood; never since confined to bed because of illness.

Present illness and condition: The patient first noticed a right inguinal hernia four years ago, at which time he stated he experienced a weak, sickening sensation while carrying a heavy weight. The herniation rapidly increased, and when I saw him was complete and approximately twelve centimeters in diameter with the patient standing. He complained of an associated backache and stinging pain at point of the hernia when protrusion was marked; he had worn a truss unsuccessfully, due largely to the type of hernia, viz., indirect.

Physical examination: The patient was rather fleshy and wore glasses; head otherwise negative; chest negative. Right external inguinal ring open sufficiently wide to easily admit a thumb. Clinical diagnosis: right indirect inguinal hernia.

Urinalysis showed the urine normal excepting a slight trace of indican. Blood examination: hemoglobin, 80%; erythrocytes, 4,520,000; lecucocytes, 7,500. Systolic blood pressure 120 mm. Hg., diastolic 90.

Operation April 8, 1918, under nitrous oxide and ether anesthesia. Preliminary hypodermic of morphine 1/6 with atropine 1/150th grain. Pulse before beginning of anesthesia 90, volume good, respirations 22. During the operation pulse 100, respirations 35, both of good volume. There was no vomiting and cyanosis was slight. Puse 100 and respirations 22 when operation completed.

Operative technic: Incision 2 cm. above and parallel to Poupart's ligament; hernial sac found to contain fundus of bladder and loop of small intestine. The sac was incomplete at ring due to herniation of the bladder. A portion of the sac with its peritoneal fat was sutured over the uncovered portion of bladder which completed the sac. The bladder was then returned to the abdominal cavity and the intestine reduced. The new sac was closed by purse-string suture and the distal portion removed. The usual Bassini operation was performed with the addition of a suture above the internal ring, and transplantation of stump of the sac under the conjoined tendon. Plain catgut was used for suturing the peritoneum and skin; No. 2 chromic catgut mattress sutures for fascial closure. The wound was dressed with dry gauze held in place by adhesive strips. Operative diagnosis: right indirect inguinal hernia, with sliding hernia of the urinary bladder.

The highest temperature recorded after the operation was 100° F., with a pulse of 90, on the third day. Both receded to normal within the next few days. Convalescence was without untoward incident, the operative wound healed *per primam*, and the patient was discharged from the hospital well April 25, 1918.

CASE 2. W. W., a male, aged fifty-eight, with a negative family history, was referred to me by Dr. C. F. Hancock of Jeffersonville, Indiana, October 16, 1918, on acocunt of a strangulated hernia. The patient stated that he had been in robust health until five years ago, at which time he weighed two hundred and sixty pounds. A right inguinal hernia had been present throughout adult life, and a truss had been worn until three years ago. According to the history subsequently obtained, the patient had been the subject of diabetes mellitus for the last four years. There was noted considerable itching and dermatitis about the feet. The fact that he was a diabetic subject was unknown to me until after the operation had been performed, which was really an emergency procedure.

Present illness and condition: Early in the morning on the day before admission to the hospital the hernia became irreducible and painful.

*These two cases were reported in abstract before a meeting of the Jefferson County, Kentucky. Medical Society, December 2d, 1918.

The attending physician attempted, unsuccessfully, to reduce the intestine through the ring. During the next thirty hours the patient vomited almost constantly, bile and material feculent in odor being noted in the vomitus. Dr. Hancock was called at that time and, recognizing the serious nature of the existing pathology, sent the patient to the hospital for immediate operation.

Physical examination: Head negative except for soreness of the gums and absence of teeth. Heart and lungs normal. Abdomen not distended. A tense, elastic, tender mass was noted in the region of the right external abdominal ring. Clinical diagnosis: strangulated right inguinal hernia.

Operation October 16, 1918, under nitrous oxide and ether anesthesia. Pulse 120, respirations 22, when patient placed on the operating table. There was some vomiting during the executing of the operative steps. At close of operation the pulse was 120; respirations 24; volume of both good; no cyanosis at any time.

Operative technic: Incision in inguinal canal, extending downward over tumor-mass. On opening the hernial sac considerable effused fluid escaped. The sac was found to contain a loop of the ileum, a portion of the bladder, and attached to the summit of the contained bladder a solid tumor measuring 2 x 6 cm. It was noted that the spermatic cord was very dark; the hernial stricture was relieved by incision when the cord rapidly improved in color. The pedicle of the bladder tumor was clamped and the neoplasm removed, the stump being sutured with celluloid linen. The usual Bassini operation was then performed, with the addition of a stitch above the internal ring and transplantation of the stump of the sac under the muscle. Three mattress sutures of No. 2 chromic catgut were used to close the canal, and the same number employed for fascial closure. Plain catgut No. 1 was used for skin closure. The wound was dressed with dry gauze and adhesive strips. Operative diagnosis: strangulated right indirect inguinal hernia, sub-mucous bladder tumor.

Urinalysis, October 17, 1918: Odor of urine, normal; color, pale amber, clear; reaction, acid; specific gravity, 1025; albumin, a distinct trace; sugar, large amount present; indican, small quantity; acetone, positive. Microscopic examination disclosed the presence of pus and epithelial cells, an occasional blood cell, and a few hyaline casts.

As soon as it became known that the patient was a diabetic subject he was placed on the Allen treatment. Improvement was rapid, sugar promptly disappeared from the urine, and he made as smooth a convalescence as any patient I have ever operated upon notwithstanding our misgivings as to the ultimate outcome for the first few days after the operation.

Urinalysis, October 27, 1918: Odor of the urine, normal; color, amber; reaction, acid; specific gravity, 1020; albumin and sugar, negative; indican, a trace. An occasional epithelial cell was found; no casts present.

The second day after the operation the patient's temperature was 100.5° F., pulse 120. Both receded to normal the following day and remained so throughout convalescence. The patient was discharged from the hospital cured on November 1, 1918.

The bladder tumor was submitted for examination to Dr. Stuart Graves of the Pathological Department, University of Louisville, and his report follows: Gross description specimen consists of ovoidal mass 35 cm. long, pale to dark red, smooth and glistening. It has been split longitudinally and presents a reddish yelow, lobulated cut surface. Microscopical diagnosis: fat, with slight, acute inflammation.

SUMMARY.

(1) Sliding hernia (*hernie par glissement*) involving any of the abdomino-pelvic viscera is infrequently encountered, and sliding vesical hernia is the rarest type known.

(2) Sliding hernia is noted with greater frequency in males than females in the proportion of about four to one; it usually accompanies inguinal hernia in the former and femoral hernia in the latter.

(3) Sliding hernia seldom occurs in young subjects of either sex, those of middle and advanced age being most susceptible; but there are strange exceptions to this rule.

(4) No viscus completely invested by peritoneum can become the sliding part of a hernia, in the absence of anatomic abnormality.

(5) The ante-operative diagnosis of sliding hernia, irrespective of what may be the sliding viscus, is a physical impossibility.

(6) The sliding portion of a sliding hernia cannot become strangulated, although strangulation of the true contents of the hernial sac is commonly observed.

(7) The treatment of hernia, including the sliding type, is essentially surgical; and unless the nature of the pathology be promptly recognized and extreme care exercised in executing the operative steps, irreparable damage may be inflicted upon the sliding viscus.

400 THE ATHERTON.

DISEASES VERSUS DISEASE

Notwithstanding the wails of the pessimists, mankind is steadily improving in bodily strength and vigor.

The average length of life is greater and the standard of bodily health higher than ever before; and, if it were not that medical and sanitary skill now preserves, for a life of imperfect health, many weak persons who in former times would have succumbed to the first attack of disease, the standard would be even higher than is actually the case.—*American Journal of Clinical Medicine.*

URACHITIS SUPPURATIVA.

WELLER VAN HOOK, A.B., M.D.
CHICAGO, ILLINOIS.

Urachitis has been described with sufficient frequency to enable the physician who bears his elementary embryology in mind to make a diagnosis at once in typical cases.

The writer saw a case of this kind in the year 1893 and reported it to the Chicago Gynecological Society in February, 1894. The essential points in that report may be quoted as follows:

"*Personal History.*—The child was in perfect health, exhibiting no morbid condition of any organ or any functional disturbance of any kind, until three weeks old, when it had abdominal pains followed by diarrhea and vomiting. Indigestion, doubtless caused by bad feeding, recurred frequently until about November first. The child then improved and digested its food much more perfectly. In spite of the poor hygienic circumstances by which the child was surrounded, and in spite of its poor alimentation, it grew fairly well and possessed a good amount of adipose tissue. In the latter part of November the child began to be ailing, took its food poorly, and cried when handled. The mother then noticed a protrusion of the abdominal wall below the umbilicus, the skin at first appearing of a normal color, afterward becoming a dusky red. The swelling kept increasing in size and the skin above and below the umbilicus kept getting more red, until, four weeks after the beginning of the malady, the swelling attained the size of a large orange. The mother then applied hot applications over the tumefaction for several days, with the result that an enormous amount of pus discharged spontaneously through the umbilicus. The mother strenuously denies that fluid of any kind had previously passed the umbilicus. She insists also, upon the closest questioning, that the amount of pus discharged was at least four ounces. The child improved to a certain extent, although pus continued to be discharged from the umbilicus, for two weeks, when cystitis began, as shown by very frequent micturition, great restlessness, and evident pain in the genitals when urine was voided. At the same time the parents noticed a swelling beginning to be formed in the right inguinal region."

"Examination made at this time, upon presentation of the child at the clinic, gave the following result: Child 6 months old; girl; of average development; presents no evidence of disease of the heart, lungs or digestive organs. The child urinates repeatedly during the examination, the urine passed being of a straw color and quite turbid. The umbilicus projects slightly upward and forward, apparently pushed in this direction by a tumefaction the size of a small apple, which also pushes forward the abdominal wall between the navel and the pubes. The centre of this globoid tumefaction seems to be about one inch behind the abdominal wall. The tumefaction is covered by skin of a very slightly reddened color, but the umbilicus has a red, inflamed appearance. A thin pus trickles slowly from a small opening in the lower portion of the umbilical fold when pressure is made upon the tumefaction. A small pocket probe can be passed downward and backward about one and a half inches. Palpation gives a sensation of bogginess in

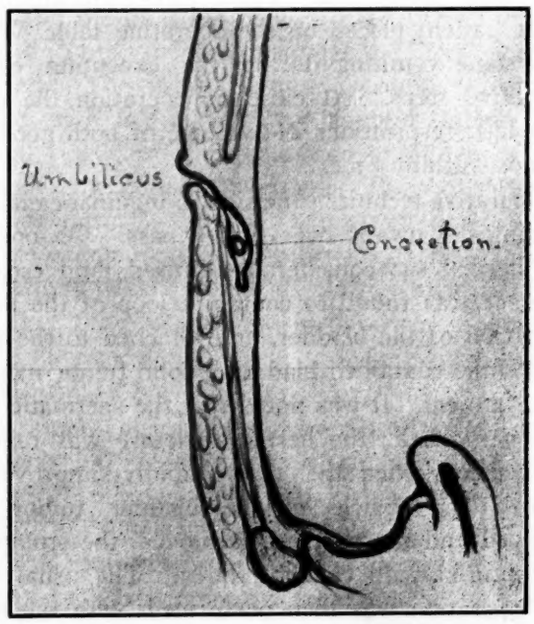

Fig. 1. Diagram of Abdominal Wall in Section Showing Concretion in the Old Urachal Tract.

the region of this swelling. In addition to this enlargement in the median line there is also a swelling in the right inguinal region about one and a half inches in length. This swelling corresponds to a number of superficial inguinal glands which can be palpated through the skin. They have already become bound together by inflammation of the connective tissue between them."

"Treatment was at first confined to daily irrigations with peroxide of hydrogen solution, with drainage by means of a small piece of gauze introduced into the umbilical opening. After four days' trial of this method improvement was found to be so slow that it was decided to drain the abscess more thoroughly. The child was accordingly anaesthetized with chloroform on January 2d, 1894, and the opening dilated with an artery forceps.

Examination could now be made quite freely; the probe could easily be passed down almost to the pubes, and laterally to a distance of about one and a half inches. The bladder was not entered by the probe. A small drainage tube was introduced and fastened in place by a stitch. The suppurating inguinal glands were opened and scraped out, and the resulting cavity packed. Daily dressings caused the two cavities to close completely in about one week."*

The writer has recently observed an additional case, which was complicated by the presence of a foreign body.

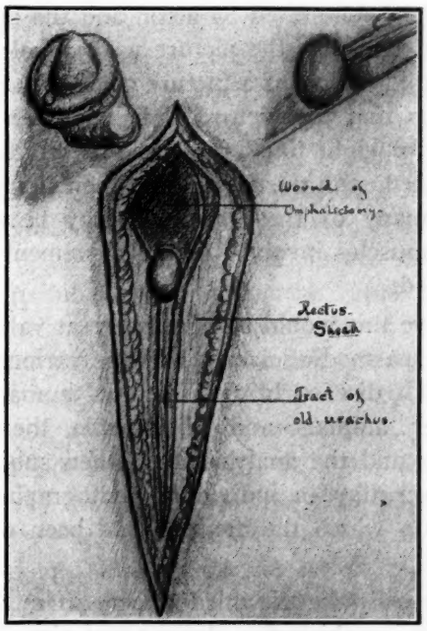

Fig. 2. The Excised Umbilicus, to the Left Above. The Concretion, Slightly Enlarged. The Larger Drawing Shows the Wound; Above Where Omphalectomy Was Done; Below the Opened Urachal Tract.

Miss S., aged sixteen years, without having received any injury, even so much as an abrasion, suddenly noticed one morning a discharge and tenderness at the lower part of the umbilicus. This inflammation increased and a mass formed involving the lower half of the umbilicus and the tissues of the abdominal wall behind the skin and subcutaneous fat. The skin moved freely over the aponeurotic structures but the abdominal wall projected slightly at the place mentioned, the tissues being involved for a distance of two inches downward toward the pubes and one inch laterally from the midline. Palpation revealed a firm mass associated with the abdominal wall.

At the umbilicus was an opening admitting a small silver probe just above a pea-sized mass of new formed granulation tissue. The probe passed into the abdomen and downward towards the bladder for a distance of three inches, evidently traversing an adventitious canal behind the linea alba. The probe seemed to lie in a free space but slightly larger than necessary to receive the instrument. No roughness or other evidences of the presence of a foreign body was noted.

The writer recognized the fact that he had to deal with a patent suppurating urachus and made an attempt to close it by dilating the opening for drainage and by repeated introduction of a probe bearing lunar caustic upon its point. But though a strong solution of silver nitrate was later introduced from a syringe through a fine probe-like canula into the cavity the cauterization had no other effect than to excite a well marked reaction.

Although the probe passed down toward the bladder, urine never escaped from the umbilical opening nor did pus contaminate the urine. So the urachal remains did not seem to communicate with that viscus or to involve it in any way.

Since healing did not occur it was necessary to proceed by an open method. Under ether anesthesia a median incision was made from the middle of the umbilicus downwards half way to the pubes and extending through the linea alba. When the recti muscles were thus separated from one another the probe, previously passed into the urachal tract, was laid bare beneath a layer of granulating connective-tissue and covered with pus. But a few moments were needed to scrape out granulations, to remove redundant scar tissue and to excise the umbilicus. The linea alba was closed with interrupted satures of chromicised catgut. Healing occurred rapidly without complication. The young woman has remained well.

My friend, Dr. Louis J. Mitchell, of Chicago, kindly supplies me with the following notes:

Miss M., aged 29. Moisture at umbilicus for several weeks, amount did not increase, never enough to term it "discharge," merely moistening of the skin. Otherwise no pain or discomfort. Directed to apply peroxide and after drying to dust on powdered boric acid. After a few days, on removing gauze a concretion was found in the dressing. This was about ⅜ in. by ⅛ in., chalky, white and possessed a fetid odor. After extrusion of the mass the discharge stopped promptly. (Nothing abnormal to be seen or felt before appearance of the concretion, no fistulous opening, no induration or tenderness.)

Cullen's* painstaking and praiseworthy study of such cases considers much additional material but

*American Journal of Obstetrics, Feb., 1895.

*The Umbilicus and its Diseases, 1916.

does not add much that is new to our conclusions of the earlier day upon this particular phase of urachal disease. But the richness of material which the literature now provides and Dr. Cullen's laborious analysis of symptoms makes his work indispensible on the general topic.

The diagnosis and treatment are in entire accord with our common knowledge of the anatomical, pathological and surgical principles involved.

31 N. STATE ST., CHICAGO, ILL.

THE MOVING PICTURE AS A MEANS OF TEACHING MEDICINE AND SURGERY.*

W. O. OWEN, COLONEL (Retired), U. S. A.,
WASHINGTON, D. C.

There are few things which the profession of medicine understand so little of as the value of the moving picture in teaching medicine. Very few men realize that at the present moment there are at least four varieties of these moving pictures.

In order that this explanation may be understood, it must be borne in mind that the original projecting of the moving pictures occurs at the rate of 16 per second.

The first of the varieties and the only one which, so far as I am aware of, has been used in medicine, is the ordinary 16 to the second moving picture, taken without any accessories to mark either time or distance.

The second of these moving pictures is where the pictures have been taken at the rate of 32, 64 or 128 per second. These, when thrown upon the screen, appear to take two seconds, four seconds, eight seconds for the motion to reappear, which motion has taken, in the ordinary way, one second to transpire.

The third variety of these pictures consists of placing within the picture itself the elements of both time and distance.

The fourth variety of moving picture is the *animated diagram,* or drawings superimposed upon each other to the end that the motion apparently has been created.

The ordinary moving picture I do not care to discuss. Its value as a teaching force is comparatively minor, for the operator, unless very carefully trained, does not keep the field of operation clear from blood, and blood blots out the entire field; and unless the operator has carefully trained himself beforehand, he is very apt to forget and permit his own hands or his body, or that of some one of his assistants, to obscure the field of operative procedure. Then again, unless the photographer is carefully trained beforehand to operating room processes, he does not realize that he is to take the field of operation only, and that when he permits a hand or a body to intervene between his lens and the field of operation that he is getting a picture that is not wanted. The result of these combinations is that very few of these pictures are of real value from the standpoint of the teacher of medicine.

I recall one instance in which the operator was endeavoring to secure the middle meningeal artery, but a jet from it came into view and the field was immediately obliterated by blood and the operator's hands did the rest; the picture was valueless.

The rapid taking of a picture at 32, 64, etc., simply means that the picture is being taken at two, four, six or eight times the speed at which it is to be projected upon the screen, and then slowed down so that many of these motions may be analyzed and the muscles involved in the movement may be determined.

I believe this would be of very great value in the study of spasmodic seizures, and the various twitchings which disease brings forth in human beings and other animals, and will enable them to be analyzed; and the analysis itself then subjected to further scrutiny in individual photographs of the cases upon which the analysis had been originally made.

If you will take the third variety of moving picture, that in which the elements of time and distance have been placed, it will enable the medical profession to utilize that most valuable method so widely developed in the engineering world, known as the *simultaneous motion chart,* by which both the time and distance elements are charted into rectangular figures upon a chart and the relation of these in time is placed upon the chart.

It is my belief that if the cycle of movement of man and other animals, in the various spasmodic muscular movements, is charted as I have suggested, that these movements will show upon the simultaneous motion chart the regularities or irregularities of the cycle of movement. This will enable the medical man studying these charts to determine almost instantly whether there is involved mental action, either conscious or unconscious, or whether it is dependent upon some central disturbance or destruction. Particularly valuable would this be should some operator develop a special technic which he desires to teach other men, which he has hitherto been unable to do because of his in-

*Read before the Orthopaedic Section of the New York Academy of Medicine, January 18, 1919.

ability to demonstrate clearly, so rapidly does the position of his hands and instruments change in the performance of this technic. The rapid motion picture would instantly throw this upon the screen and explain it in detail and he would then be able to teach any man his automatism, thus enabling him to perform it with equal celerity and precision, for the majority of these technical movements have been unconsciously developed, and the man himself does not truly know with precision just exactly what he has done.

As for the fourth and last variety, this is perhaps the most important of all. In this the teacher creates the diagram of that which he wishes to express to his class and in words describes it in detail to an artist; the artist makes a series of drawings, carrying the one into the other in such manner as to avail oneself of the visability of the eye. When one sees motion, the movement of this motion in many cases is so rapid that one does not receive a conscious impression of the components of the movement. For instance, the spokes of a wheel rapidly turning produces a very rapid succession of impressions upon the retina, and one is given the impression of movement because one is conscious that it is movement. This is a fact so far as the majority of motions are concerned.

If you will make a picture of a nail and a hammer and lay them upon a picture to be photographed by the moving picture camera and take a picture of them, and then place the hammer on top of the nail in the position it would have assumed had it struck the nail, and take, let us say, two photographs of it in that position,—then cut the end off of the drawing of the nail, and move the hammer and the nail down so that the cut end of the nail shall rest where the point formerly did, and take a couple of pictures of that, when these six pictures are thrown upon the screen, you will see the hammer leave the position from which it started and hit the nail a blow and drive it into the wood.

Now, this principle is utilized by the teacher desiring to make animated diagrams; he makes the beginning of the motion, what the position will be half way between, and that which it will assume at the end, and then the artist puts in the necessary number of drawings to fill in the position and the motions which have transpired. If he desires that the motion shall be very smooth and very free from jerkiness he makes a large number of drawings and only takes two pictures of each one of the drawings; if he takes four pictures of the drawings, the drawings then appear upon the screen in one-fourth of a second, because these pictures are running through at the rate of 16 to the second, with the result of jerkiness. With two to the second it only means one-eighth of a second,—and where the impression upon the retina does not exceed one-eighth of a second, the jerkiness does not appear. When it gets to one-fourth second or more, the ordinary eye gets the distinct fixed position of the image, and when you substitute for that a new image one-fourth or one-half second further along, and the same image again appears, still further along, there is a distinct jump in it, because there is a distinct impression upon an entirely new part of the retina.

I have had part in the creation of quite a number of these diagrams, which have been made by quite expert medical men and very expert artists,—one, for instance, of femoral hernia, operated upon by the inguinal route: another showing the travel of the nerve influences from the semi-circular canal to the cerebrum and its effect in producing nystagmus; still another showing the methods of Dr. Albee in bone graft; the method of producing the rale in the diagnosis of tuberculosis, and of the auscultation and percussion of the chest.

It would also be very useful in such a process as showing the irregularities of the heart motions through injuries done to the bundle of His or to the pneumogastric nerves.

All of these are quite easily created and it appears to me that it ought to be a function of the National Government to create these films for the medical profession, to make them available to the profession for teaching purposes through some such agency as the Commissioner of Education or other branch of the Government devoted to educational purposes.

These matters were begun, and have been, up to the present moment conducted by the Office of the Surgeon-General of the United States Army, who has on file quite a number of these processes.

It might also be interesting to know that there has been developed in the Office of the Surgeon-General two instruments of very great value in this work.

One of these is a tandem printing machine in which the pictures are printed, let us say, the first picture twice, the second picture twice and so on, tandem, through the entire picture, also making a tandem of four, a tandem of six and a tandem of eight. These are very useful where jerkiness is not a matter of moment, but any picture may be slowed down one-half by means of this printing machine. No jerkiness appears in pictures which are taken at 16 to the second or are projected at 16 to the second, and the introduction of extra pic-

tures, when it does not lengthen the time to a period exceeding one-eighth of a second, does not produce a jerkiness which is noticeable.

There has also been produced here an extra rapid camera with which pictures have been taken with a timing device in the field, showing that the pictures had been taken at the rate of 128 to the second. This, when coupled with the tandem machine, will enable you to throw upon the screen a picture in the ratio of 1 to 16 in relation to the time of taking, so that a picture which took one second of actual time to take will go down upon the screen at the rate of 16 seconds instead of one second, and thus the movement may be analyzed quite easily.

REMARKS ON METHODS OF TEACHING MEDICINE AND SURGERY BY THE CINEMATOGRAPH.*

MAJOR K. TUNSTALL TAYLOR, U. S. A.,
Office of the Surgeon-General,
WASHINGTON, D. C.

I am presenting abstracts from my work in the Office of the Surgeon-General, illustrating the recent methods of teaching orthopædic surgery to medical and line officers and enlisted men in the Army.

As a supervising surgeon, it early became apparent to me, in lecturing at various cantonments or to any large body of students, that simply the verbal lecture, with the limitations of the human voice and the absence of illustrations or clinical material, was inadequate for attention and retention by the memory; charts and slides were impractical, so that the moving picture, on my initative and the hearty cooperation of Colonel Owen, was established in the Surgeon-General's Office and the other specialties soon availed of it.

In creating these lectures, I have had in mind not only military instruction, but adding teaching facilities available for use in our civil medical schools, upon request to the Surgeon-General.

It soon became apparent to Colonel Brackett, Director of our Division, and the rest of us engaged in this instruction, that it was expedient to go into the most rudimentary facts regarding locomotion, the prevention of avoidable disability and the recognized treatment of the more common affections of the lower extremities. Some thousands of feet of film I prepared on these subjects alone.

After completing our task of instruction in preparation for over-sea duty, our attention was next directed to the demonstration of methods for the immediate care of the wounded.

Finally, our efforts have been to portray in detail the technic of surgical reconstruction in tendon, muscle, bone work, etc.

The moving picture film will bring the student into closer touch with clinical material, certain symptoms such as neuroses, epileptic seizures, tics, etc., than are ofttimes available in hospital routine instruction and difficult to describe, but the so-called "close-ups," as shown by "the movies," will bring the student intimately in contact with the operating table, which is often not possible from an amphitheatre seat. The details of arterial, nerve or intestinal anastomosis, bone grafting, application of mechanical principles of direction and technic in tendon and muscle transplantations for deformities and application of deep sutures are brought home and fixed in the memory as by no other means of instruction, save actual experience later in the procedures themselves.

This mode of instruction, in conjunction with the didactic lecture, has been found to yield a higher average mark per student than any other mode of teaching.

The moving picture possesses the advantage over the lantern slide in that the component parts of a lecture cannot be disarranged, broken or lost, nevertheless inserts or additions can be made, almost unlimited positives can be printed from the original negative at the same cost as slides, and films are lighter and more easily transported than slides. A simple modern attachment is also now available for stopping the moving picture machine at any point without burning the film, when it is desired to emphasize some special picture, thereby putting it in a less costly class than the slide, which has not heretofore obtained and was an objection.

By means of the moving picture in comparative teaching of the future, the medical student will also be able to see the modifications of several surgeons in performing a given procedure; thus a class may see the technic employed at the clinics of this and other countries at the same sitting and appreciate the value of the points made in each. It is thus very broadening in its educational possibilities. Or a clinical professor, who wishes to illustrate his systematic course of lectures, but is lacking in clinical material, can resort to a moving picture record of the desired cases, symptoms, signs, operation, etc.

The films of the Army Medical Museum will be available to teachers in the army and medical schools and the profession, just as the books in the

*Read before the Orthopaedic Section of the New York Academy of Medicine, January 16, 1919.

Surgeon-General's Library are for study or reference, provided transportation, safe handling and return in good order or replacement are guaranteed.

It is hoped that the profession will cooperate in giving films to this department or allow it to make copies of existing negatives.

It has been brought to the attention of the Surgeon-General's Office that certain commercial film companies, having made medical films, wished to charge this department for copies or the profession for exhibition purpose on a commercial basis. Physicians could easily and should specify, when approached to demonstrate a new original procedure for a "movie" company, that a copy be sent to the Surgeon-General for the profession at large, before permitting it to be made.

Many facts in the prevention of acute foot strain, the so-called flat-foot, and the explanation of the large number of torn ligaments at the knee and ankle in trench jumping at the cantonments have been explained by this department and moving pictures prepared to demonstrate how to jump correctly and prevent such disabilities. Also as a result of this film, instruction in standard foot examinations, shoe fitting, correct balance and marching, to be used in the Army, have become or will shortly be issued by the General Staff as general orders, etc.

By diagrammatic or "stop-motion" line-drawing or "animated drawings" as they are called, a most valuable instructive preliminary is at hand to precede a picture of an actual operative procedure. Demonstration of details in brace construction, fitting and therapy, and especially in recording, charting, measuring departures from normal gait, this new national aid to orthopedic surgery is an added asset, divested of the costly obstacle which has prevented its addition as a routine in the teaching of standard methods by many heretofore.

My plan in teaching my students any given operative procedure is to show them the "animated drawing" first, then a "close-up" of an actual operation and other surgeons' technic in that condition, and finally the operation itself, on the living subject, with illustrative cases before and after the operation.

Gain may be temporary and uncertain; but expense is constant and certain.—Buy War Savings Stamps.

THE TREATMENT OF BURNS IN NAVAL WARFARE.

C. P. G. WAKELEY, M.D.,
Temporary Surgeon, R. N.,
H. M. HOSPITAL SHIP "GARTH CASTLE."

Burns and scalds are of frequent occurrence in the Navy, even in times of peace, and the percentage has increased enormously during war conditions.

Burns are often of great magnitude, being the result of accidents such as boiler or cordite explosions. Some suffer from burns pure and simple, others from serious accompanying wounds, and when, in the case of cordite, the explosion occurs in a turret or other confined space, great pressure is developed as well as intense heat, which forces

Fig. 1.

the gaseous products of combustion into the tissues and is responsible for some of the effects produced.

In the Dogger Bank Action and the Battle of Jutland[1], [2] I had to treat about 150 cases of burns at R. N. Hospital, South Queensferry, and these burns were plentiful and extensive. Since these were mostly due to sudden flashes of cordite, it was rare to find a burn of more than a third degree, and equally rare to find them affecting parts of the body other than the face and hands. Burns due to shell explosions and scalds due to boiler explosions are generally of a graver nature than those due to flashes of burning cordite.

The treatment of burns should be expectant as well as immediate. At the Battle of Jutland the majority of cases when they arrived at the hospital

had been treated with the Service picric acid dressing, but patients from H. M. S. "Tiger" who were under the supervision of Fleet Surgeon Muir[3] and had been treated with an oil antiseptic dressing, and these, in my opinion, did much better than those treated by picric acid.

Picric acid without a doubt is most practical and efficient first aid dressing in some respects, but should only be used as a first aid dressing and nothing more. An oily antiseptic dressing which I have been in the habit of using for some years consists of: Menthol, 3 grains; eucalyptus oil, 3 minims, and carron oil to the ounce; this preparation is spread on white lint. Such a preparation has several advantages over a picric acid dressing; it does not adhere to the skin, its application and removal are painless. This cannot be said of a picric acid dressing; for, although it has been applied wet, it soon becomes dry, especially in a ship and during and after action, when the cases are treated in confined spaces, and where the air is hot and dry.

Also such an oily dressing is non-toxic, antiseptic, soothing and acts as a deodorant.

For superficial first degree burns Rosalan Solution,* which was introduced by Surgeon-General Sir G. L. Cheatle, K.C.B., F.R.C.S., or Malachite Green Solution are excellent preparations and the skin grows well under the scab formed.

Heavy liquid petrolatum has been used with good results by Barker[4]. It can be sprayed on the burn by an ordinary oil atomizer or applied on a swab, and is entirely painless. It was found that agar cultures of streptococcus albus, streptococcus aureus and B. subtilis covered with mineral oil were checked in growth. This treatment with liquid petrolatum is very useful in first and second degree burns, but is not so good for burns of the third degree.

Much has been written regarding paraffin preparations in the treatment of burns, and of these preparations No. 7 paraffin as used by Lieut.-Col. A. J. Hull, R.A.M.C.,[5] and Ambrine are, in my opinion, very useful for the treatment of burns in hospitals and hospital ships; but I consider that Ambrine is not the best first aid dressing for a battleship in action. Its application takes too long where many men have to be treated. Surgeons in a dressing station on a battleship may at any time have to work by the aid of candles and heating Ambrine by candle flame would take a long time. An Ambrine outfit is supplied to all ships of the Navy and is very compact and full instructions are given as to use (see also *Lancet*, February 3, 1917), but its usefulness, in my opinion, is limited to isolated cases of burns which often occur in the every-day life on board. Such cases can be treated with Ambrine and often do very well.

It is claimed by some people that skin-grafting is no longer necessary in the after treatment of burns treated by Ambrine. With this I cannot agree and I have had to resort to skin-grafting many times after Ambrine treatment.[6] Medical men in France state that deep burns treated with Ambrine heal without any scar tissue, but I have always found that scar tissue forms in the ordinary way, as seen in Figure 1.

The great ambition of the Naval Surgeon should be the prevention of deformities following the 3rd degree burn and I quite agree with Parker,[7] who made the statement that "however extensive they may be, as long as they are compatible with life, healing may and should be obtained without deformity and with good function;" this does not apply to the face.

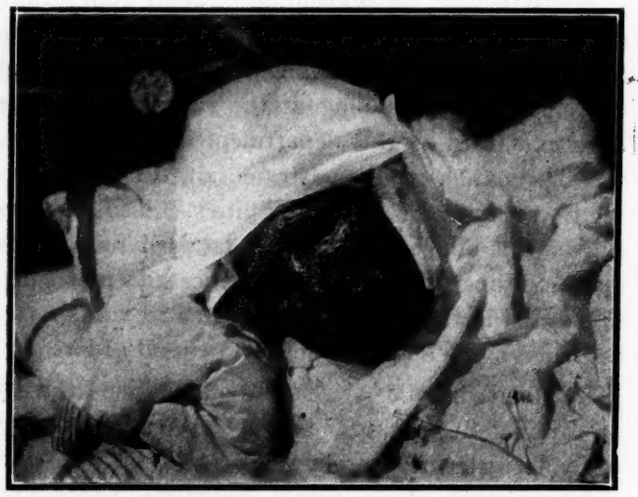

Fig. 2. Burn Due to Shell Explosion During Treatment, H. M. S. Warspite.

War burns are septic burns, and heliotherapy in my mind plays a very valuable and important part in the treatment of them. Heliotherapy has been greatly used in France during the war in the treatment of septic wounds. Cases of burns received at R. N. Hospital, South Queensferry, after the Jutland battle were treated with the oily emulsion I have mentioned above. The emulsion was applied to the face and hands and no dressings were used. The patients were kept out of doors in the sunshine as much as possible. The men enjoyed the treatment and it was found that the burns quickly crusted over, an exudate formed beneath the crust, which was raised and took on the appearance of rupia (see Figs. 2 and 3). The crust fell off in

*Rosalan, 1 part, mydraryperchlor, 2 parts; spt. vini dect, 1000 parts.

time, leaving a reddened, healthy surface without scar. I never use face masks in the treatment of burns of the face, the patients dislike them intensely; and it is impossible to treat any purulent conjunctivitis, which is often present and requires frequent irrigation. I do not advise dressings for the limbs as advocated by some[8] as I consider that the exudation becomes pent up and increases the toxemia of the patient. Fomentations are used by[8] some surgeons directly a burn becomes septic and since I consider that all war burns are septic burns it would constitute the only treatment. I strongly condemn this form of treatment, because fomentations cause burns to become deeper and a 3rd

Fig. 3. The Final Result of Treatment of Fig. 2. No Scarring or Deformity.

degree burn can be produced from one of the 2nd degree, this[1] I have proved both clinically and experimentally. I have found that the application and removal of fomentations are very painful.

In the old literature one finds recorded cases of pneumonia, gastric and duodenal ulceration, intestinal hemorrhage, suppression of urine and tetanus following severe burns. In none of the fatal cases I treated was any such complication found at the post mortem examination; the fatal cases died of shock. I did not have a single case of nephritis in the burn cases received after the action on May 31st, 1916, and I am of the firm opinion that cases of nephritis are much less frequent when treated without dressings than with them.

Burns of the 4th degree, especially if extensive, require skin grafting; but before this is undertaken it is essential that the wound is made up of healthy sterile granulations. This can be verified by bacteriological examination of a film, because a distinction must be made between clinically sterile and bacteriologically sterile lesions. Thiersch's method is mostly used, but Reverdin's and Wolf's methods both have their place in the treatment of burns of the face and hands.

In conclusion, I consider that as a first aid dressing in action an oily preparation on lint should be used. In quiet times and in civil life "Ambrine" or some form of paraffin preparation can be used. In the after treatment of burns heliotheraphy plays a very important, if not the most important, part.

REFERENCES.

1. Temporary Surgeon C. P. G. Wakeley, R.N., Journal of R. N. Medical Service, III, No. 2.
2. Temporary Surgeons W. M. Ash, R.N., and C. P. G. Wakeley, R.N., The Lancet, 1916, II, 56.
3. Fleet Surgeon Muir, R.N., Journal of the R. N. Medical Service, Vol. II, No. 4.
4. C. Barker, New York Medical Journal, Vol. CIII, No. 25, Page 1197.
5. Lieut. Col. A. J. Hull, R.A.M.C., British Medical, 1917, Vol. I, Page 37.
6. Temporary Surgeon C. P. G. Wakeley, R.N., Lancet, 1918, Vol. I.
7. C. A. Parker, Journal of American Medical Assoc., Vol. 67, Page 565.
8. Staff Surgeon R. J. Willan, R.N.V.R., British Medical Journal, Vol. II, 1916.

LEADING UP TO MODERN OPERATIVE BONE SURGERY.*

GEORGE CHAFFEE, M.D.
BINGHAMTON, N. Y.

Until a very few years ago members of the medical profession were quite well satisfied with the results they obtained from treating fractures, whether simple or complicated, by methods which, up to ten or twelve years ago, were considered right, or at least as good as the practice of those days could secure.

In former days except in cases of non-union and in fractures of the patella and olecranon, it was a rare thing for a surgeon to operate upon a fracture, and in the cases mentioned the results were often far from satisfactory. Surgeons who were noted for their original work were on the lookout for some better and more satisfactory method of treating bone lesions. Silver wire, although the best agent we possessed for many years, for fixing the fragments and maintaining approximation, yielded its place to kangaroo tendon, which has stood the test of time. The late Dr. John B. Murphy, however, had for several years been using phosphor-bronze wire for this purpose.

*Read at the Quarterly Meeting of the Broome County Medical Society, held at Binghamton, N. Y., Jan. 7, 1919.

Frank Hamilton and D. Hayes Agnew, both of whom were called to treat President Garfield in his last illness, were considered the leading bone surgeons of their day. Dr. Bigelow of Boston, Dr. Nathan Smith of New Haven, Dr. E. M. Moore of Rochester, N. Y., Dr. Swinburne of Albany, and Dr. N. Y. Leet of Scranton enjoyed almost phenomenal success in the treatment of fractures by the old method.

To Dr. Lewis S. Pilcher, of Brooklyn, N. Y. City, my esteemed colleague and co-worker, belongs the honor and credit of teaching the profession the true pathology of Colles' fracture and a correct and easy way of reducing the fracture without causing further damage and inflicting unnecessary trauma, and all this without the open operation.

The late Dr. Nicholas Senn, after much original and experimental work, brought out his decalcified bone chips. This agent was used for a time, but is no longer in use.

The late Dr. A. M. Phelps of New York endeavored to graft a portion of bone, supported by the nutrient artery, from the arm of a dog, into the bone of a boy's leg, but met with failure. Dr. Phelps' efforts in this case were honest and most praiseworthy, but at that time the clouds had not cleared, and he met with criticism from both the profession and the daily press.

The works on Fractures and Dislocations by Frank Hamilton, W. L. Estes, Stimpson, Roberts and others are excellent and served their purpose well in former times. But the times, customs, and practice are continually changing.

The accidental discovery of the *x*-ray, its application in the diagnosis of fractures and its aid in suggesting to the surgeon the correct line of procedure in all bone lesions, marks the most important era to date, in bone surgery the world over.

Surgeons were quick to see the advantages of the *x*-ray in many branches of surgical practice outside of bone work. Today the *x*-ray department of every well-equipped hospital is busy with important work.

Formerly in making a study of the progress of fractures by the aid of the *x*-ray the surgeon's first and chief interest was in apposition and alignment. Of late, close observers, however, have been interested in going a step further, and in watching the wonderful changes at different stages of bone formation, the work of the osteoblast in building up, and of the osteoblast in tearing down, and clearing away material no longer of use, and finally, the end results of Nature's perfectly wonderful work—new bone formation.

END RESULTS.

The use of the *x*-ray has enabled observing surgeons to see that end results of the old-time closed method of treating fractures are not always as good as they might desire. Results were often bad. They found overlapping and consequent shortening of the limb present more often than they had expected. Bad alignment, angulation and weak, awkward limbs, sometimes of little use, not infrequently resulted.

There may be a deficiency in the lime salts of the bone, the blood stream may carry a specific germ. or shreds of muscle and fascia may be caught between the ends of fragments; the broken bone fails to unite and non-union occurs.

Nature has done her best to repair the injury, but she has been hampered in her efforts. Conditions have not been favorable for her delicate work. She is not willing to allow the case to be recorded as a failure. n her silent way she appeals and signals to the surgeon for aid and assistance, which is really *all he can ever do.* But when he responds to her call, we have a right to expect that he will come well equipped for his work, with the most complete and modern set of instruments to be found.

If the surgeon does this and does his work well —what may we expect and what may we see? Barring infection, we should see Nature cause the sick to be healed, the broken bone to unite and the lame to walk. To the maimed and crippled child who has never been able to walk and play in the sunshine this means much.

When surgeons, guided and directed by their *x*-ray findings, began operating to correct bad end results, with such instruments as they had at hand, their work was tedious and results were often far from satisfactory. Then came the need and call for a more complete and modern set of bone instruments.

SPECIAL INSTRUMENTS—SPECIAL TECHNIC.

Geiger, Albee, and Frank Hartley have each devised and worked out a complete set of motor-driven instruments for bone work. The wonderful works that are being done today in bone surgery could not be done without slow-running motor-driven instruments.

Bone and joint work is delicate and very difficult to perform, but the more familiar one becomes with osteogenesis and end results the more fascinating becomes the practice of operative bone work.

There is no branch of surgery so particular and difficult to perform as bone and joint work. To go through the soft parts and operate on the bony

framework of the body, to open into and operate upon a joint, and get out without infection, and secure the results desired, requires the most thorough aseptic precautions and careful attention to details on the part of the surgeon, assistants, and nurses. But the relief given and the results obtained from operative treatment are so wonderful and so satisfactory that one feels well repaid for every effort put forth.

Geiger says: "It cannot be too often mentioned that bone surgery does require a special technic. Vigorous aseptic precautions in preparation of the operative field, the surgeon, and his assistants are absolutely essential."

OPEN METHODS.

Estes, Geiger, Albee, Crile, Frank Hartley, Chittenden, Wainwright, Guthrie, Marcy, the Sharpe brothers, the Mayo brothers and many others have been supporters of the open operative treatment.

For a number of years the late Dr. John B. Murphy's wonderful bone and joint surgery had attracted attention and admiration all over this planet. The bone and joint work of this shining star of surgery will ever stand out as a prominent part of the magnificent monument which John B. Murphy unconsciously erected to his own memory. He made a close study of Nature and her signals and tried to supply what she lacked and was calling for to finish her work. In doing this, he has left a record of his findings and experience to illumine our pathway so that "he who runs may read."

Great credit is due Lane of London for his pioneer work in establishing the open method of treating fractures and for the perfect operative technic which he has developed, but I do not believe that the metal plate is to be compared in any way with the autogenous bone graft in the operative treatment of vicious fractures.

EDUCATION.

It was not so very long ago that some members of the medical profession and the public held that the knife was only to be used as a last resort in the treatment of cancer. Today we all know that every vestige of cancer should be removed at the earliest possible moment.

It required a campaign of education to inform the public that tuberculosis is a communicable but preventable disease, that the open air life with sunshine, good food, and proper hygienic care are the essentials in the treatment of that disease.

When we first began operating for the relief of appendicitis the medical profession was divided into two classes—the conservatives and radicals—on the question: "Shall we operate or shall we wait?" Today the public knows very well that as soon as the family physician is sure of his diagnosis, the sooner the patient is placed in a hospital and the operation is performed, the better are the chances for recovery. There is no discussion of the question today. It is settled for all time. The answer is: *operate, and do it now.*

FRACTURES.

Today there is a difference of opinion in the medical profession on the question of the treatment of broken bones, and of course the public as yet is not fully informed. The question is: Shall a broken long bone, and certain others, be treated by the non-operative method or by the modern open method? Is an operation necessary?

Some medical men say we shall try the old or closed method first and if it is not satisfactory we can try the open operative method later on. If the closed non-operative method is not a success, it means loss of time—in some cases months—and later on, if an operation is decided upon, this means a much more tedious and difficult operation for both surgeon and patient. Delay may not jeopardize the life of the patient, unless the bone becomes infected, but if an operation is necessary and the patient is not given the benefit of it, someone is certainly taking chances on at least a possible disability, and possibly the patient may become crippled for life. In such cases who is responsible? The family physician and the bone surgeon whom he calls in consultation are responsible.

If this matter is fully explained to a patient he is not at all likely to take any chances on going through life carrying a crooked and disabled arm, wrist or hand or a thigh bone with one inch or more of shortening, if such a disability and deformity can possibly be prevented—and, in most cases, it can be prevented.

TIME.

The time to settle the question of operative or non-operative treatment of a broken bone is as soon as possible after the accident causing the fracture has taken place. How can the question be settled? By the aid of the *x*-ray and a consultation with an expert bone surgeon.

It is clearly the duty of the medical profession at all times to do all in its power to instruct and inform the public on matters of public health, prevention, safety, and the spread of disease. In the matter of advising the public in regard to the treatment of broken bones the medical profession, and especially the family physician, supported by an expert bone surgeon, can do a world of good in the way of preventing disability and disastrous end re-

sults, which includes earning powers and economic conditions as well, and these points will be observed and noted by the public.

When the family physician has been called to a patient with a broken bone or a dislocation and has made his patient comfortable with a temporary dressing, he should not rest until he has brought to his aid the *x*-ray and counsel of a bone surgeon. It is no reflection upon the ability of the family physician to do this. It is the right and proper thing for him to do. In doing so, he is looking after and guarding the very best interests of his patient and in turn is protecting himself, for such a course divides responsibility. We should never forget that the most important part of these cases is the patient.

HOSPITAL TREATMENT.

As time goes on and we gain more from experience, we find that more fracture cases are being operated. This does not mean, however, that all cases should be operated, neither does it mean that operative treatment should be left as a last resort, in cases where operation is clearly indicated. If a case is one requiring operation—in justice to all—this fact should be determined with as little delay as possible

Fractures of all long bones are best treated in hospitals, where the attending surgeon or his assistant can daily make careful observation and notes as to the condition of the circulation and nerve supply, pain, swelling and color of the injured limb, especially of the hand and fingers, in fractures of the arm. This cannot be done with the patient off in the country.

It is not safe to allow fracture cases of the humerus or of one or both bones of the forearm, after a dressing has been applied to go to their homes off in the country and remain there for from two to five days without being examined by the attending surgeon. In that time, under certain conditions, irreparable damage to the arm may take place.

No surgeon can do full justice to himself, or to his patient, who does not examine these cases daily during the first two weeks of treatment, and some cases should be seen twice daily.

I believe that the day is not far distant when the family physician will fully realize that in cases of long bone fractures the best results are to be obtained from hospital treatment, and that he will be unwilling to take the responsibility of treating these cases in their homes.

TRANSPORTATION.

This brings us to the matter of transportation—the motor ambulance has settled the question of transportation. It has reduced the time, distance and pain of transportation to a minimum. We no longer hesitate to transport our fracture cases, but a very comfortable temporary dressing, that will fix the fragments, *without a preliminary circular bandage* with an abundance of cotton, should be applied. If it is a compound fracture, apply a 50% solution of iodine, a pad of sterile gauze and over that strips of adhesive plaster, but do not encircle the limb with adhesive.

Today, even in very remote districts, the farmer has his car, and in case of an accident to his family or neighbor, he will quickly improvise an ambulance, and the case is soon on its way to the hospital. When our boys and nurses have returned from the front, they will give valuable aid in transporting our injured to hospitals.

A CHANGE.

During the last ten years we have been passing through a test period for bone work, and have now reached a point where a decided change from non-operative to operative treatment of many broken and diseased bones is to be made. Included in this change, I am satisfied that we shall very soon see fractures of all long bones, whether operative or non-operative, treated in our hospitals. There, I believe, is where they should be treated, for there is where we can give our patients best end results, with stronger, more perfect and more useful limbs.

Within a very short time the advantages of operative bone and joint work will be observed in more satisfactory end results and the reflection of this improvement will create a demand from both the profession and the public, for operative treatment, when it is indicated.

This decided change and advance step in treatment will create centers for bone surgery work, surrounded by large fields, and as a result of this, I foresee special wards or special hospitals for bone work. Long trips with the motor ambulance and by Pullman will quickly transport, without pain, all fracture cases to bone hospital centers.

When all fracture cases are treated in hospitals, the responsibility and anxiety attending the treatment of these cases in their homes with no facilities, will be transferred from the family physician and the family, to the operating bone surgeon and the well-equipped hospital.

Dr. W. L. Estes of South Bethlehem, Pa., than whom we have no higher or more reliable authority, says: "The Committee on Fractures of the American Surgical Association collected 1,745 cases of fractures, the end results of which were ascertained

and the patients examined. Of these 1,358 cases were non-operative and 387 were operative cases; 258 cases of simple fracture were operated, and 129 cases of compound fracture were operated. A little over 25 per cent. of the cases were operated.

"I find that of 97 major fractures of long bones treated in St. Luke's Hospital last year, we operated on 35, about 37 per cent.

"The open method when adopted should be employed early. It may be used at any age period except in senile cases whenever a skiagram shows a deformity or a position of the fragments which obviously cannot be reduced or when proper efforts at reduction and retention have proved unavailing.

"The sooner the adjustment or setting is done after the injury, the better and quicker the recovery.

"Reparative processes begin early, much earlier than surgeons have hitherto seemed to think. If setting the fracture is delayed, what already has been done by natural processes, will be destroyed and the second attempt to do the osteocementation will not be as quick nor as energetic.

"Open operations for simple fractures should be undertaken only by experienced surgeons who are thoroughly equipped by training and who have proper instruments and apparatus to meet all the possible indications of the operation."

COMPENSATION.

In cases of appendicitis and in fracture cases, the family physician who gives of his time, diagnostic skill and ability, before a case is sent to the hospital, should be paid a fee commensurate with the valuable service performed and the responsibility assumed in these important cases. The family physician should not allow his patient in fracture cases to depart with the idea that the service which he has rendered is trivial and but ordinary in character, although not more than from one to three visits or dressings may have been made. If he does allow this, the fault is his, and he can blame no one but himself.

Having made his diagnosis, properly applied a comfortable temporary dressing, and assisted in starting the patient on his way to the hospital, or if time permits, going to the hospital with him, the family physician has rendered a valuable service and is entitled to reasonable compensation. When the proper time arrives, the doctor is entitled to receive his fee, duly earned by his services, which were of importance and advantage to the injured as a preliminary to succeeding specialized service.

In writing and presenting this paper my object has been twofold: 1. To bring this question in proper form to the attention of the medical profession and to point out, or indicate, what I consider the attitude of the profession should be in regard to the management and treatment of broken bones. 2. To inform the public of the wonderful advances and changes which are being made in bone surgery and of the many benefits along this line, to which the public is justly entitled.

In doing this I feel that I have done my duty up to this point, in the way of trying to prevent disability and disastrous end results in these unfortunate fracture cases.

SALVAGE OF MANPOWER.

The principle of salvage extended to the vital assets of the nation would redound to our social, economic, and financial advantage in no uncertain way. Of the 2,500,000 men examined for the National Army in 1917, 33 per cent. were rejected because of physical unfitness. It has been estimated that about 3 per. cent. of our population is constantly disabled by illness, though various sickness surveys suggest that this percentage is more nearly 2 per cent. Every man, woman, and child on the average loses about nine days per year as the result of illness. The annual wage loss as a result of illness to the workers of the country may be conservatively estimated at from $500,000,000 to $750,000,000. This large sum does not represent the loss to industry as a result of the interference with the normal working of the vast industrial machinery during the period represented by the illness of the workers.—*American Medicine.*

SURGICAL SKILL.

While every practitioner expects to render the best service of which he is capable, it has often been demonstrated that complications will arise even in the simplest cases. There is no punishment for carelessness if all ends well; but if the results are less than expected there is likelihood of an action for damages, even where the utmost caution has been exercised. While contributory negligence is frequently a help in time of trouble, it is not safe to rely upon it, for when such an issue is raised the patient usually has the advantage in the matter of furnishing evidence. A surgeon may well approach such a case, therefore, with the assumption that he shall have to defend his diagnosis and treatment at every step of the way. He should exercise such skill as will bear the scrutiny of a court of law.—*C. L. Young in the Journal-Lancet.*

ESOPHAGEAL DIVERTICULUM.

(With Report of a Case.)

GEORGE A. HENDON, M.D., F.A.C.S.
LOUISVILLE, KENTUCKY.

Current surgical text-books contain exceedingly meager information concerning esophageal diverticula. For example Keen and White dismiss the subject with one short paragraph: Diverticula from the pharynx and esophagus which are congenital also indicate incomplete closure of the branchial clefts, and occur in the same regions as the fistulæ; occasionally they are not congenital, but acquired. In several instances they have been successfully excised and the margins united by Lembert sutures.

Johnson is equally brief: A diverticulum may be found at the upper portion of the esophagus, and demonstrated by its filling with bismuth mixture which has been swallowed. Diverticula may also be found at the lower end of the esophagus, but the condition here is more apt to be a dilatation secondary to spasm, as the esophagus passes through the diaphragm,—the so-called cardiospasm.

MacCallum merely states that more localized dilatations are the traction and pulsion diverticula. The traction diverticula are common, and usually small and funnel-shaped; they arise from the persistence of connections between the esophagus and trachea, or from the adhesion and contraction of adjacent inflamed lymph glands. The pulsion diverticula are the outcome of local weakening of the esophageal wall and the forcing outward of a hernia-like sac. These may become quite large, and are annoying in that they receive the food until they are full, and may, by their bulk, offer obstruction to the main channel.

Warthin accords the subject space more commensurate with its recognized importance, and his views in abstract are: Esophageal diverticula are of two forms, viz., (a) pressure diverticula, and (b) traction diverticula. The former are rare and arise from pressure within the lumen; the latter are more common and due to external traction pulling the wall outward. Pressure diverticula occur most frequently at the junction of the pharynx and esophagus on the posterior wall and extend downward between the esophagus and the vertebrae; the muscular wall is weakest normally at the point where these diverticula occur. Local bulging is caused by trauma from swallowing large and firm pieces of food, etc.; the bulging is increased by pressure of the food, and gradually there is formed a saccular pouch, the mucosa and submucosa bulging between the muscle bundles of the inferior constrictor of the pharynx. In some instances muscle fibers have been found in the sac wall and the condition has been regarded as an ectasia due to disturbance in closure of the fetal cleft. When the diverticulum becomes filled with food there may be noted dysphagia, "gagging," and vomiting. Decomposition of the sac contents may occur, followed by maceration of the lining epithelium, secondary infection, ulceration, and phlegmonous esophagitis or periesophagitis. Traction diverticula are more commonly observed. They occur usually in the anterior wall near the bifurcation and result from an extension of inflammation from neighboring lymph glands with adhesion to the esophageal wall and subsequent cicatricial contraction pulling the wall outward. The lumen of the diverticulum may point downward, horizontally, or upward; it communicates with the esophageal lumen by a round, oval, or longitudinal opening of varying size. Several diverticula may exist coincidently. In the majority of instances the lymph glands attached are tuberculous. Traction diverticula may exist without symptoms. However, through perforation of the sac chronic purulent periesophagitis may be induced with extension to pleura, pericardium, lungs, etc., and a fatal termination ensue.

CASE REPORT: H. Z., a male, aged twenty-eight years, occupation barber, was referred to me by Dr. Eggers because of a tumor in the right submaxillary region of eleven months duration which had developed gradually without pain. Provisional clinical diagnosis: adenitis. Operative discovery, esophageal diverticulum: First operation May 6th, 1918: second operation July 28th, 1918 (local anesthesia): Ultimate result, August 23rd, 1918, completely healed. The following account of this case may prove interesting.

The patient had never been seriously ill. Eleven months ago he first noticed an enlargement beneath the right inferior maxilla. The growth was painless and gave him no serious inconvenience. There was no dysphagia nor difficulty in the mastication of food, but the gradual increase in size of the tumor caused the patient considerable uneasiness. He applied to a physician who lanced the growth, but he does not know the character of the material which was discharged.

When the patient consulted me the tumor had attained the size of a large walnut, and I at first thought it was an enlarged submaxillary gland. Operation was advised and performed on May 6th, 1918, under a general anesthetic. When the tumor was exposed it seemed to become larger the nearer its origin was approached. The general direction

was downward toward the sternoclavicular articulation, outward under the clavicle, upward and backward beneath the floor of the mouth, but without causing any bulging within the buccal cavity.

It was now recognized that we were dealing with a totally different pathology than we had at first suspected. During manipulations incident to exposure of the tumor the sac ruptured and eight ounces of semi-solid and liquid food was expelled into the operative field. Of course the true nature of the growth then became plainly apparent, i. e., that it was an esophageal diverticulum. The diverticular sac was united to the platysma muscle, the excess of the sac wall amputated, and the incision then closed with ample provision for drainage. The course of convalescence was uneventful, the patient being discharged from the hospital ten days after operation. Through the sinus deliberately formed by the operation small quantities of food particles continued to be discharged; but the patient was able to change the dressings as required and to keep the parts clean. The sinus closed several times which fostered the hope that spontaneous occlusion might ensue.

On July 28th, 1918, under local anesthesia, the wound was reopened and the sinus walls with the adjacent cicatricial tissue carefully dissected downward to the esophagus and removed. The "stem" was ligated with catgut and the stump inverted, the overlying tissues being then replaced and sutured over the point of inversion. A satisfactory recovery followed this second operation, and by August 23rd, 1918, complete healing had occurred.

The foregoing case is considered of sufficient importance to warrant detail record. It serves to illustrate the fact that esophageal diverticula may occur with such frequency as to merit earlier and more general recognition. It also shows that such diverticula may exist for a considerable time without interference with mastication, deglutition or digestion, and also without the regurgitation of food. This patient had never exhibited any of the inconveniences which are usually considered constant accompaniments of esophageal lesions.

Another reason for recording the details is to direct attention to the desirability of executing the operative steps in two stages, and to further emphasize the facility with which such lesions may be treated by the two-stage operation. It seems certain that ante-operative recognition of esophageal diverticula would become more general were it not for the prevailing idea that their rarity entitles them to be classified merely as surgical curiosities; and that adequate surgical treatment would be more promptly undertaken if the facilities furnished by the two-stage operation and the reasonable assurance of a satisfactory outcome were more generally understood.

According to the views of Judd, esophageal diverticula are in reality only herniæ involving the mucosa and submucosa which project through the muscular coats. In traction diverticula distortion occurs from a "pulling" force outside the esophagus where it crosses the left bronchus. "Traction diverticula usually produce no symtoms and are of no surgical importance." (Judd). The author says, however, that Tetens found of eighty traction diverticula, six had assumed the characteristics of the traction-pulsion variety from food accumulation and pressure from within, which would indicate that this type may eventually become important from the standpoint of surgical treatment.

Probably less than two hundred cases of pressure diverticula have been recorded in the literature of the world. Stetten, in 1910, collected sixty operated cases with a mortality of 16.6 per cent. Judd's series includes thirty-five cases with two deaths. "Before the use of the modern methods of examination many of these cases were diagnosed as cardiospasm, esophageal stricture, and carcinoma. In many instances gastrostomy has been performed for esophageal diverticulum on the assumption that the obstruction was caused by malignancy." (Judd).

Pressure or pulsion diverticula practically always occurs in one situation, viz., "the cervical region in the unsupported esophageal wall at a point directly opposite the cricoid cartilage." It is claimed (Judd) that in this location there is a weak point in the musculature, i. e., at the esophago-pharyngeal juncture, sometimes described as the "pharyngeal dimple;" but just what is the determining etiologic factor in the production of pressure diverticula has not yet been definitely demonstrated. It has been shown, however, that esophageal pressure is greatly augmented during deglutition, and it seems likely the pressure is further increased by the swallowing of large masses of imperfectly masticated food. Hirsch observes that deglutition is bucco-pharyngeal and esophageal, that food is forced downward through the esophageal lumen by peristaltic action, that the upper orifice must be closed to permit the esophageal contents to enter the ventriculus, otherwise regurgitation occurs. While it is presumed these physiologic phenomena noted by Hirsch have been verified by other observers, I am unable to locate the confirmatory data.

The clinical symptoms ordinarily induced by the presence of an esophageal diverticulum were en-

tirely absent in the case just reported, and the diagnosis was consequently not perfected until the tumor was surgically exposed. The physician to whom the patient first applied for advice was evidently also unaware of the nature of the pathology, otherwise he would not likely have lanced the tumor. The first manifestations usually noted are: dryness of the fauces with a sensation similar to that induced by the presence of a foreign body in the throat. The patient complains of dysphagia, and nausea with regurgitation of undigested food particles finally supervenes. When the diverticular sac attains sufficient proportions a palpable fluctuating tumor is noted beneath the angle of the jaw. The left side is more frequently involved than the right, but no reason can be assigned for the disproportion. For obvious reasons the clinical diagnosis may present some difficulty, but accuracy can usually be assured by careful anamnestic and clinical investigation. Confirmatory evidence is afforded by roentgenographic and esophagoscopic procedures.

The treatment of esophageal diverticula is essentially surgical and if the diagnosis has been correctly made, gastrostomy as a preliminary measure should not be performed unless the patient is in imminent danger of starvation and rectal alimentation is found impossible or is deemed inadequate. The inevitable desideratum is obliteration of the diverticular sac, and various methods have been devised by which this may be successfully accomplished. The most satisfactory procedure is believed to be excision of redundant portions of the sac with closure of the remaining opening by suture and inversion according to the plan pursued in the case reported. I cannot too strongly emphasize the importance of executing the operative steps in two stages as already described. The two-stage operation is also recommended by Mayo where the diverticulum has attained considerable proportions, and Murphy advocated this method of procedure in all cases. Mayo first dissects the sac free, leaving the neck attached; the sac is not opened during the first stage, but left outside the neck in the dressing; the skin edges are sutured to the esophagus at its juncture with the diverticulum. After ten or twelve days adhesions have formed about the sac, when it may be excised without an anesthetic and the edges inverted into the esophagus. "This operation is not difficult and is perfectly safe from any possibility of infection and has been very satisfactory in our cases in which the sac was fairly large. The infolding operation in the case of small diverticula and the two-stage operation for large diverticula seem to be very satisfactory and safe methods of procedure in all cases of diverticula of the esophagus." (Judd).

Perkins states that gastro-intestinal roentgenology has exposed pathology formerly considered rare but now known to be of comparatively frequent occurrence. Esophageal diverticula, non-ulcerative gastric diverticula or hernia, and sigmoidal diverticulitis, are among such lesions. The author has seen a gastric diverticulum holding a pint diagnosed by the roentgen-ray. He reports the case of a female aged forty-five, with cough and bronchitis, good appetite, but having gastric distress. Ten years ago following pneumonia she first noticed regurgitation of medicine and food sometimes ten hours after ingestion. She was treated for "nervous dyspepsia and cardiac spasm." Fluoroscopic and radioscopic examination in the vertical position showed retention of four or five ounces of barium mixture. Only on changing to the recumbent posture did it overflow and proceed through the esophageal lumen to the stomach. The diverticulum was situated at the level of the sternoclavicular articulation.

Mosher recently devised a new method of treatment, viz., dividing the common wall between the diverticulum and the esophagus. The primary step is to locate the opening of the pouch and also that of the esophagus, which is best accomplished under ether with a "ballooning" esophagoscope. Then with scissors the wall is divided to within one-eighth of an inch of the bottom, this small rim being left to avoid opening the mediastinum. There is but slight bleeding, the field being kept clear by suction The patient is nourished by rectum for two days; bougies are passed at the end of a week. The ultimate fate of the sac after cutting its wall has not yet been determined, but the outcome in three cases lead the author to conclude that the procedure is easily accomplished, is probably safe, and results in a clinical cure.

Bevan records a case of pulsion diverticulum of the esophagus successfully treated by the Sippy-Bevan operation, which is substantially as follows: A long incision is made over the sternocleidomastoid muscle from clavicle to angle of jaw; the sternocleidomastoid muscle is drawn to the outer side and the omohyoid muscle divided between two clamps. The inferior thyroid artery is clamped at two points, divided, and each cut end ligated; with a blunt retractor the carotid artery and internal jugular vein are carried laterally and the upper part of the esophagus exposed. With blunt dissecting forceps the upper portion of the diverticulum is then secured, care being exercised to prevent rupture; arming the fingers with a piece of gauze

the sac is then gradually drawn from the thoracic cavity into the operative field. The sac is obliterated by a series of vaselined linen pursestring sutures and invaginated into itself and the esophagus. In the case reported four pursestring sutures were used, the first three being of linen and the final suture of iodine gut. "This was done because the three linen sutures will be passed into the esophagus eventually and the last pursestring suture of iodine gut will, of course, be absorbed and produce firmer cicatrix." Depending upon its size, therefore, the sac may be obliterated with pursestring sutures alone, or, if so large that its entire inversion into the esophagus might produce obstruction, it may be about two-thirds obliterated with pursestring sutures and then five or six longitudinal suture inserted. The after-management is important. The patient is given liquids by rectum for twenty-four hours, and later fed by a rubber tube passed through the esophagus into the stomach, or into the esophagus well below the point of the diverticulum. (Bevan).

Gaub and Jackson devised a plan of operation in which an esophagoscopist assists the surgeon by pushing the diverticulum outward into the external wound with the inserted esophagoscope; the pouch is seized with forceps by the surgeon, after which the esophagoscope is withdrawn from the pouch and inserted deeply into the subdiverticular esophagus. It then only remains for the surgeon to amputate the saccular redundancy. The advantages claimed for the operation are: (a) time-saving, which is especially important in senile, feeble patients, (b) ease of locating a small diverticulum, which when empty as it must be for operation is often difficult to find, (c) accurate removal of the proper amount of redundancy to effect a cure and prevent recurrence without risk of future stenosis. The authors advise the use of intratracheal insufflation ether anesthesia, which not only removes the anesthetist far from the operative field, but renders the patient safe from the risks of glottic spasm so often induced by irritation of the vagus or recurrent.

Lefiler describes a female of thirty-four who had extreme idiopathic dilatation of the esophagus, also a pulsion diverticulum opposite the junction of second rib and sternum. Recurring bronchitis with lassitude suggested pulmonary tuberculosis, and the esophageal anomalies were only casually discovered during roentgenoscopy. The large diverticulum had given percussion findings simulating those of a tuberculous cavity, but there was no reaction to tuberculin.

REFERENCES.
Bevan: Surgcial Clinics, Chicago, 1917.
Gaub-Jackson: Surg. Gyn. and Obstet., July, 1915.
Johnson: Operative Therapeusis, 1915, vol. iv, Appleton, New York.
Keen-White: Am. Text Book of Surgery, Ed. 4, 1903, Saunders, Phila.
Judd: Surgery, Gyne and Obstet., August, 1918.
Leffler, Hygeia, August 16th, 1917.
MacCallum: Text Book of Pathology, 1917, Saunders, Phila.
Mayo: Quoted by Judd, 1. c.
Mosher: Surg. Gynec. and Obstet., August, 1917.
Perkins: Bull. Dept. Pub. Char., New York, 1917.
Warthin: Ref. H. B. of the Med. Sci., 1903, vol. vi.

SENTRIES AND HEALTH.

"The greatest asset of a nation is the individuals which compose that nation, and the greatest asset of the individual is health." Without health all opportunities of endeavor are valueless. The individual who is broken down in health is not an asset to his country, but a liability, a lien, either upon his friends, his own capital, or upon society.

In times of crises like the present, "The race is not to the swift, but to the strong." The sick and ailing cannot be called into any field of endeavor where physical endurance is put to the test. The weak are but an economic encumbrance.

As the chain is no stronger than the weakest link, so is each individual a link in the community life. One essential to the well-being of a community is the immediate investigation and abatement of disease. The individual who goes about scattering disease germs is weakening every link in the great chain. Like the sentry who stands on watch while the camp is asleep, each individual owes a duty to his community to conserve the public welfare by promoting sanitation and healthful conditions and by eradicating foci of infection.—*Public Health, Michigan State Board of Health.*

RESPONSIBILITY OF THE SOLDIER TO KEEP FIT.

The best protection that government and people can give will not take from the individual soldier the responsibility for not putting his health needlessly in jeopardy. Every failure to prevent a case of venereal disease in a soldier reflects on the adequacy of the steps which the Army and the States are taking to safeguard against such incapacity, but it reflects to a still greater degree on the individual soldiers who ran a known and unnecessary risk of destroying his usefulness in the army and of serious future danger to wife and children.—*Public Health; Michigan State Board of Health.*

American Journal of Surgery
PUBLISHED BY THE
SURGERY PUBLISHING CO.
J. MacDONALD, Jr., M.D., President and Treasurer

92 William St., New York, U. S. A.
to whom all communications intended for the Editor, original articles, books for review, exchanges, business letters and subscriptions should be addressed.

SUBSCRIPTION PRICE, TWO DOLLARS.
FOREIGN, TWELVE SHILLINGS.

Original Articles and Clinical Reports are solicited for publication with the understanding that they are contributed exclusively for this journal.

It is of advantage to submit typewritten manuscript; it avoids errors.

CHANGE OF ADDRESS. Subscribers changing their address *should immediately notify us of their present and past locations. We cannot hold ourselves responsible for non-receipt of the Journal in such cases unless we are thus notified.*

ILLUSTRATIONS. Half-tones, line etchings and other illustrations will be furnished by the publishers when photographs or drawings are supplied by the author.

☞ SPECIAL NOTICE TO SUBSCRIBERS ☜

The "American Journal of Surgery" is never sent to any subscriber except upon a definite written order. Present and prospective readers please note this.

WALTER M. BRICKNER, M.D., F.A.C.S., Editor

NEW YORK, MARCH, 1919.

A PLEA FOR THE CONSIDERATION OF SURGERY IN THE TREATMENT OF SUPPURATIVE CONDITIONS OF THE LUNG.

The time is not so distant when the opening of the abdomen for the removal of the diseased appendix or even for the socalled "interval" appendix operation was a weightily discussed subject. Sometimes the intervention of general peritoneal infection with its inevitable consequences cut short the discussions and considerations. There grew up, during this period a race of surgeons, brave enough to risk the dangers of the moment and wise enough to study means to overcome them. That modern surgery has developed to the point it has reached today is proof enough of their far-seeing wisdom. Unfortunately, the domain of surgery, aside from the special branches, seems, in the minds of too many of our modern surgeons, and all too many of our internists, to be limited to below the diaphragm. The bold spirit who invades the thorax is like one who enters the wildest jungle—an adventurer who is lucky to escape with a life—in this case his patient's. Should the patient recover the knowledge is received with a smile and a shrug of the shoulders by the self satisfied Tory who with his smug pseudo science sits still and expects the rest of the world to do the same.

It is conceded, and by none more freely than by those who know the most about it, that the opening of the chest cavity and the surgical manipulation of the lungs is fraught with danger. Any operation is one of first magnitude and only to be performed by one well versed in the technic and fully conversant with the dangers and untoward possibilities. But after all the same can be said of the surgery of any other region and of any other kind. It is true that the mortality from the operation is high. It is acknowledged that the percentage of recoveries is small. However, no one will have the temerity to deny that one of the main reasons for the success of surgery of the abdomen is the early recognition of surgical indications by the internist who sees the patient first and knows the difference delay will make.

Patients offer the greatest hope for recovery in inverse ratio to the extent of the pathological process. Be the suppuration an abscess with walled off cavity or a dilatation of the bronchi and bronchioles with suppuration, the more limited the suppurating area the better chance the patient has. If removal of the suppurating area—the logical procedure in other parts of the body—will cure the patient, obviously partial removal will not. Therefore it becomes apparent that if the suppuration tends to spread, speedy operation offers the patient his best hope. It must be admitted that "expectant" treatment and ineffectual interference, which cause a spread of the disease process, will only jeopardize the patient further. If the suppuration be confined to one lobe of one lung that lobe can be removed. If, however, an entire lung be involved or, perhaps, both lungs, it is difficult to anticipate any good results to be achieved by the removal of a part of the offending organ. The internist who sees these patients first and who can by means of the *x*-ray and bronchoscopy definitely localize the process is neglectful of his duty if he does not appreciate the indications early, before the process has spread, and offer the patient the chance of a surgical cure.

That the operation is dangerous cannot be denied; that the results of non-interference are deplorable must be admitted. The situation then resolves itself into subjecting the patient to a fearful risk, taking him deep into the Valley of the Shadow, in return for which, if he recovers he will be a well man. To one familiar with this class of patients with their horrible expectorations that forbid them the company of their fellows the risk does not seem so great.

As opposed to operative methods what has medical treatment to offer? Expectorants for a time in the beginning, open air treatment (many of these

unfortunates first receive diagnoses of tuberculosis and are treated on that basis until beyond the help of surgery), artificial pneumothorax when the great majority if not at all, have adhesions that will prevent the collapse of the lung, even granting that its to be a method whose results justify its use. Expectant treatment can merely wait to see what will happen, knowing that only one thing can happen and then pharisaically shrug its shoulders and go on to the next great question mark.

It is undeniable that occasionally a case is cured spontaneously, but then only early in the disease and very, very rarely. True, the report of these instances magnifies them and their occurrence is gratifying but does not justify us in scientifically praying for miracles. Would any of the advocates of "Expectancy" offer it to a patient with a carcinoma of the breast? There are instances of spontaneous cure of that malady. With the knowledge that there may be a recurrence and that the risk from the operation may have to be lived through again, are patients not urged to early operation as the one promising means? Is it not just to grant and offer the only chance to a patient, who is willing to take all his chances at once, to rid himself of a loathsome, foul disease, with the alternative of coming out of the ordeal well—or not at all? L. G. K.

PRIMARY EXCISION AND SUTURE.

While war has been responsible for many modifications and adaptations of surgical technic, together with the introduction of a varied assortment of antiseptics, there have been few evidences of actually new methods. For this reason, the primary excision of wounds in the stage of early contamination, followed by primary closure, stands out with greater prominence.

As Bloodgood points out (*Progressive Medicine, Volume XXI, 4*), the immediate suture of incised lacerated wounds is by no means novel, no more than the removal of foreign bodies to prevent infection, "but the deliberate resection of a huge gunshot wound, removing all the foreign bodies and all the contused and devitalized tissue, as one would resect a malignant tumor, and then the primary closure, is an achievement of this war." Hull states that if the infected wound can be excised within the first twelve hours, an almost aseptic result can be achieved regardless of the further treatment. If the excision is postponed until a state of inflammation exists, the prevention of infection is uncertain even though larger areas of tissue be removed.

Shell and shrapnel wounds are generally infected, and, therefore, should be excised promptly whether the missile be retained or not. Wounds with considerable destruction of tissue, readily subject to infection, also call for free primary excision. In a sense, the primary excision of wound and bullet tracks may be regarded as more potently prophylactic than any other form of treatment. The significance of primary excision lies in its applicability in such diverse fields of surgical treatment as compound fractures, cranial injuries, wounds of joints and amputations. According to Hull *Surgery of War*, "septic compound fractures have been treated by the excision of a cone-shaped piece of tissue enclosing the septic tract, with the result that the fractures have healed like aseptic fractures."

Primary excision does not necessarily involve primary suture. After the removal of the potentially infected area, which may contain missiles or other foreign bodies, as bits of clothing, dirt, etc., hemorrhage is controlled, and further treatment determined. In theory, a primary excision should be productive of a thoroughly clean wound which can be made to heal by primary union after suture. Unfortunately, practice does not always support the theoretical conclusion. The greater the degree of infection previous to primary excision, the greater is the hazard of primary closure. The insufficient removal of tissue may be followed by a late sepsis, or the removal of too much tissue and prompt closure may result in loss of function which cannot be corrected without re-opening the wound.

Primary suture naturally is desirable, but it must be undertaken only when there is certainty of the complete removal of the infected area. A delayed primary suture avoids the risk incident to primary closure and is followed by rapid healing, which is a great advantage over the ordinary prolonged treatment of open wounds.

The introduction of this special treatment of lacerated, punctured, or contused wounds, including foreign bodies, and possibly infected material, represents a distinct advantage in surgical technic. It merits a place in the ordinary procedures of industrial surgery. It demands, however, a higher degree of attainment in surgical judgment and procedure. Primary excision and primary suture promise to be of tremendous advantage in preventing waste of function, delays incident treatment, and complications and sequelæ, so common to septic involvement of wounds. Is is a form of treatment which tests the surgeon and tries his surgery. It merits continued use under normal surgical conditions. I. S. W.

POSTOPERATIVE PNEUMONIA.

Attention has recently been called to the fact that postoperative pneumonia is a far more frequent complication than is ordinarily acknowledged. Whipple* points out that the most important predisposing factors are: recent or concurrent inflammation in the upper respiratory tract; pulmonary congestion; inhibition of normal respiratory movements as a result of an abdominal incision; debilitated states; and an increase in the number and virulence of the pneumococci in the winter and early Spring. The *x*-ray has proven valuable in demonstrating the lesion before physical signs can be elicited.

After certain classes of operations—notably those in the upper abdomen—postoperative pneumonias, varying from a small patch centered about some bronchus, to a full blown consolidation limited by the boundaries of one or more lobes, are frequent, are causes for much concern, and contribute appreciably to the total mortality. In a certain proportion the character of the clinical course gives sufficient reason for the assumption that the process is a reaction to bacterial infection, induced or precipitated by an impoverished general condition; and it is reasonble to interpret the complex as an intercurrent infection, interrupting the smoothness of the convalescence to which one is ordinarily accustomed.

In other cases the clinical course lacks the usual markings of a pneumonia of the lobar or lobular type, and the impression is lacking that the condition owes its existence to bacterial trauma. In a few of these the shape and location of the compromised lung tissue, and the characteristics of the physical signs, indicate rather clearly that the process is of an embolic or infarctive nature; and the assumption has been frequently proven true at postmortem examinations. It is very possible that the great majority of the pulmonary complications, occurring in the postoperative period, owe their presence to embolic and infarctive phenomena.

Frequently the presence of physical signs in the lungs—rales of some kind, or an area of dullness—does not correspond with an actual area of consolidation; and the finding of fairly normal and crepitating lung, where one expected a consolidated area, is most disconcerting at the postmortem examination. These signs are most frequently found where there has been marked abdominal distension and a resultant compression of the thoracic contents; or they are due to changes in the vascular equilibrium of the pulmonic circulation.

A. O. W.

*Whipple: Surgery, Gynecology, and Obstetrics, 1918, 26, 29.

Surgical Sociology

Ira S. Wile, M.D., Department Editor.

"PRACTICAL NURSES."

The Bulletin of the *Chicago School of Sanitary Instruction,* January 18, 1919, bears, over the signature of John Dill Robertson, Commissioner of Health, a criticism of the nursing system which has failed to make adequate provision for the development of "practical nurses." His plea for the development of a group of nurses capable and willing to do housekeeping for the sick has special interest at this time when the shortage of nurses has been so thoroughly exemplified in the futile efforts of the country to provide nursing care for the victims of influenza and pneumonia. He advocates that hospitals should make provision for the training of two classes of nurses. "The first grade of training to conform to that now required, except that the time be two instead of three years for completing the course. The second class to be known as practical nurses, whose course shall consist of six months of intensive training. At least one-half of this time should consist of practical lectures and demonstrations with frequent recitations, quizzes and examinations as are conducted in any college or university." He demands a knowledge of practical housekeeping and domestic science as an important requirement rather than an educational qualification which would eliminate all save high school graduates.

While an appeal to the State Legislature may be needed to amend present nursing laws, he suggests that in event of failure to secure relief from the Legislature, the City of Chicago might enact a law licensing women as "practical nurses." The licenses would be issued by the Department of Health only after the applicants had passed a satisfactory examination as "Practical Nurses," and "should be subject to revocation upon evidence showing extortionate charges or any unethical conduct." He further recommends that practical nurses should receive not to exceed one-half the fee now paid to registered nurses.

There is considerable merit in the suggestion of Dr. Robertson, but it is doubtful if the fee which he has suggested would place the practical nurse within the financial reach of the mass of the people actually needing such nursing care. Unfortunately, during the epidemic, trained nurses did not hesitate to follow the law of supply and demand to the extent of doubling and even quadrupling their fees.

Municipalities, in rushing to give nursing assistance, not infrequently paid normal nursing fees to persons totally incompetent to perform the duties required of even nursing housekeepers. The crux of the practical nurse problem lies in the availability of a large number of individuals capable of performing ordinary housekeeping duties, and giving the simplest attention to the sick in accordance with directions left by the attending physician, at a cost far more moderate than any that has been proposed at this time. The average family cannot afford to pay three dollars a day for nursing attention during a case of illness covering one or more weeks without suffering in some other direction. The extension of district nursing, with an auxiliary group of nursing aids serving as a reserve force for emergencies, would be of greater use during an epidemic than a flood of incompetents such as have been called into service under the stress of a shortage of nurses.

At the same time, it cannot be gainsaid that the suggestion emanating from Chicago possesses much force. There must be some available nursing assistance for the general public other than that secured in the highly trained and technically developed nurse, who has gleaned her experience after three years of training and service under hospital direction. There is a danger, however, that stressing the inferior brand of nurse may result in lowering the standards of nursing in the community, a danger which must not be forgotten. The "Practical Nurse" would be impractical if real nursing were required. As a makeshift, a convenience, she would fill a great need. As a home assistant, she would play an important part in carrying through many families in time of disease and distress, when she would really be more human and more comforting than the ever reliable trained nurse.

Extending Rehabilitation in Industry.

It was natural that an attempt should be made to make provision for the vocational rehabilitation of all persons disabled in industry or otherwise patterning the system after the one adopted for the rehabilitation of soldiers, sailors and marines. Occupation as a means of overcoming physical handicaps in the economic sense has been placed upon a reasonably safe foundation. By putting more ability into disability, power may be assured and a higher degree of independence results.

According to *The Vocational Summary*, January, 1919, the Committee on Education and Labor of the United States Senate reported favorably upon a bill designed to conserve the labor power of the country, by providing an annual grant to the states giving vocational education to persons so disabled in employment as to be unable to continue it. The fact recorded, though by no means new, that three-quarters of a million casualties occur annually among wage workers in all occupations, for whom no particular provision has been made in the matter of retraining or placement, indicates the advantages to be derived by the extension of state and national aid in the re-development of old skill or the fostering of latent talents.

Leaving aside the problems of possible labor shortage, it is patent that a humane interpretation of our responsibilities to those injured in the industrial work of the country makes it just and reasonable to extend to the workers of the land the same opportunities for economic rehabilitation as have been offered to the combatant forces. The same arguments obtain for both groups of workers. The proposition itself contains nothing new, save possibly the principle of federal aid in place of ordinary compensation. This movement appears to be in the right direction. It is not merely a matter of business investment, it involves more than salvage and conservation of human resources. It inaugurates a policy for increasing the personal potentialities of a large army of persons who have become "disabled through no fault of their own, in the performance of duties necessary to the comfort and the prosperity of the country."

Obviously, the benefits of thorough training and adaptation in industry should be extended in principle. It appears to give unusual benefits to the handicapped as a further exhibition of a tendency to penalize normality. More attention and care are lavished upon feeble minded, for example, than can be recompensed in the form of financial returns to the community, but this expenditure represents a type of insurance premium which has its justification. Minor injuries might be the excuse for securing vocational and educational opportunities denied to the individual not suffering from such handicap. All steps taken towards promoting the welfare and benefit of those injured in industry should be carefully safeguarded on the basis of increased vocation, education and guidance before entrance into industry, physical examination at the time of entrance into employment, and a more or less complete system of safety devices and shop hygiene committees with a view to keeping down the accident rate in every way. The principal danger that is involved includes the possibility of lowering the carefulness of employees through giving them further assurance of unusual benefits in the event of

slight injuries, rendering them unfit for their specific process of work. This criticism, however, is by no means of serious importance when considered in relation to the magnificent advantages contemplated in the bill, which thus far has not been enacted into law.

Certainly the theory of universal interdependence requires society as a whole to bear the burden of industrial disabilities, and the nation should be willing to assist states in promoting the welfare of citizens unfortunately injured. As a means of preventing dependence, lessening criminal tendencies, and raising the economic value of manhood, the problem deserves most thoughtful consideration. Probably no solution represents a greater degree of fairness from the standpoint of those paying the costs and from the viewpoint of those receiving the benefits, than a federalized system of vocational rehabilitation acting through existent boards and bodies within the jurisdiction of states or preferably through the centralized Federal Board for Vocational Education.

Book Reviews

United States X-ray Manual. Prepared under the Direction of the Division of Roentgenology. 506 pages with 219 illustrations. $4.30 net. PAUL B. HOEBER, New York.

As an elementary study of *x*-Ray Physics and Interpretations this book is undoubtedly the most interesting, concise, and instructive compilation. It is divided into a number of chapters, the largest of which, as is to be expected for Army instruction, is the one on *x*-Ray Physics. Bearing in mind that the demand for Roentgenologists during the war required the training of a great number of men without previous experience in this specialty,—it is safe to say that the methods as outlined in this manual afforded the beginner a most excellent opportunity to grasp so complex a subject without great difficulty. The instructions are simple and not involved by technical discussions.

The chapter on Localization, the most important in Army work, gives the reader a clear idea of the various methods employed. The "Near Point" method, however, is not mentioned, which is regrettable.

A description of Army Apparatus and a résumé of *x*-Ray technic and diagnosis follow in their order.

This book serves a most useful purpose.

Radiography and Radio-Therapeutics. ROBERT KNOX, M.D., Consulting Radiologist, Great Northern Hospital, London; Director, Electrical and Radio-Therapeutic Department, Cancer Hospital, London, etc. Part 2: Radio-Therapeutics. 220 pages with 15 plates and 100 illustrations. THE MACMILLAN CO., New York.

In dealing with Radio-Therapy, as the author has attempted in Part 2 of his excellent book, the field covered is naturally an experimental one. Radio-Therapy, while successful in many instances, is not uniformly so in cases of similar or like conditions. The author has wisely included in his text the opinions, technic, and results of other authorities and leaves the choice to the reader. As this branch of science stands today, this volume covers the field fully and permits an insight into the progress thus far made.

Books Received

Surgery in War. ALFRED J. HULL, F.R.C.S., Lieut.-Col., Royal Army Medical Corps; Surgeon, British Expeditionary Force, France; Late Lecturer on Surgical Pathology, Royal Army Medical College, Milbank, and Surgeon, Queen Alexandra Military Hospital. With a Preface by LIEUT.-GEN. T. H. J. G. GOODWIN, C.B., C.M.G., D.S.O., Director-General, Army Medical Service. SECOND EDITION. With 210 illustrations. Philadelphia: P. BLAKISTON'S SON & Co., 1919.

Neoplastic Diseases. A Text-book on Tumors. JAMES EWING, M.D., Sc.D., Professor of Pathology at Cornell University Medical College, New York City. Octavo of 1027 pages with 479 illustrations. Philadelphia and London: W. B. SAUNDERS COMPANY, 1919. Cloth, $10.00 net.

Progressive Medicine. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences, Edited by HOBART AMORY HARE, M.D., Professor of Therapeutics, Materia Medica, and Diagnosis in the Jefferson Medical College, Philadelphia, Physician to the Jefferson Medical College Hospital, One-Time Clinical Professor of Diseases of Children in the University of Pennsylvania, Member of the Association of American Physicians, etc. Assisted by LEIGHTON F. APPLEMAN, M.D., Instructor in Therapeutics, Jefferson Medical College, Philadelphia; Ophthalmologist to the Frederick Douglass Memorial Hospital and to the Burd School; Ophthalmologist to the Polyclinic Section of the University of Pennsylvania. VOLUME IV. December, 1918. Diseases of the Digestive Tract and Allied Organs, the Liver, Pancreas and Peritoneum—Diseases of the Kidneys—Genito-Urinary Diseases—Surgery of the Extremities, Shock, Anesthesia, Infections, Fractures and Dislocations, and Tumors—Practical Therapeutic Referendum. LEA & FEBIGER, Philadelphia and New York, 1918.

The Hearts of Man. R. M. WILSON, M.B., Late Assistant to Sir James Mackenzie, under the Medical Research Committee. London: HENRY FROWDE, HODDER & STOUGHTON. Oxford University Press, Warwick Square, E. C., 1918. 173 pages.

Practical Dietetics. With Reference to Diet in Health and Disease. ALIDA FRANCES PATTEE, Graduate, Department of Household Arts, State Normal School, Framingham, Mass., late Instructor in Dietetics, Bellevue Training School for Nurses, Bellevue Hospital, New York City; former Instructor at Mount Sinai, Hahnemann, and the Flower Hospital Training Schools for Nurses, New York City; Lakeside, St. Mary's, Trinity, and Wisconsin Training Schools for Nurses, Milwaukee, Wis.; St. Joseph's Hospital, Chicago, Ill.; St. Vincent de Paul Hospital, Brockville, Ontario, Canada. *Twelfth Edition.* Revised and enlarged. A. F. PATTEE, publisher, Mount Vernon, New York, 1918. 469 pages. Price $2.00.

The Pawns of Fate. PAUL E. BOWERS. THE CORNHILL COMPANY, Boston. 210 pages. Price $1.25.

Autotherapy. CHARLES H. DUNCAN, M.D., Discoverer and Founder of Autotherapy; former Mechanical Engineer of the Illinois Steel Company; Co-founder of the Volunteer Hospital; Attending Surgeon and Genito-Urinary Specialist, Volunteer Hospital, New York City, 1905-1914; Honorary Member, Veterinary Medical Association, New York City. Published by DR. CHARLES H. DUNCAN, 2612 Broadway, New York City.

Progress in Surgery

A Résumé of Recent Literature.

Lymphatic Disease in Children Simulating Appendicitis. (With a report of seven cases.) HAROLD DE B. BARSS, M.D., *American Journal of Diseases of Children,* June, 1918.

Barss reports seven cases in children under puberty. These cases came to operation with symptoms suggestive of recurring attacks of appendicitis, *i. e.,* abdominal pain, nausea, constipation. The pain was over the right lower quadrant. There was no fever nor leukocytosis; the Wassermann reactions were negative. The appendix in every instance showed marked lymphoid hyperplasia.

Barss believes that this lymphoid hyperplasia of the appendix represents a more general lymphoid disturbance throughout the patient. Removal of the appendix stopped the symptoms which brought these patients to the surgeon.

Lacy claims that cultures from some cases of sinusitis will show a quasi-negative bacillus—even in direct smears. These should be looked upon as influenza bacilli. Similarly cases of indefinite etiology of meningitis may show influenzæ bacilli if cultures are made upon blood aga plates, using the centrifugal sediment of the spinal fluid picture according to Vaughan. For the last five type the x-ray is particularly valuable in making a correct diagnosis.

The sinus cases of influenzæ infection should have early pneumonia prevalent during the present influenza epidemic) and its signs masked. However, diminished breath-sounds with flatness should call for diagnostic aspiration. 4. Massive empyema; this condition occurs infrequently. 5. Suppurative polyserositis. 6. Interlobar empyema. 7. Pexamediastinal pus. 8. Polylocular empyema. 9. Latent empyema. All present rather a distinct and ample drainage.

Splanchnoptosis. G. N. KREIDER, *Journal American Medical Association,* December 21, 1918.

The writer strongly supports the ideas advanced by Glénard as regards the evil effects of splanchnoptosis, and its frequency. Only occasionally, he says, is the stomach in its proper situation, according to the anatomic textbooks, and the same is true of the transverse colon. Its common causes are improper habits as to eating, use of high heeled shoes and corsets, fashionable constricting belts and bands, etc. He asserts that it is perhaps four times as serious a matter in females as in males, though it may occur at all ages and in both sexes. While many people seem to get along without any serious symptoms from prolapsed organs, the condition is that of many hernias and potentially dangerous. Many cases may be cured by proper bandaging, posture and dieting, and operation should not be resorted to until other methods have failed. We have changed our conceptions as to the ordinary forms of colitis, and no longer consider it as of nervous origin. Lane's operation of extensive resection of the bowel is rarely necessary, but operations attaching the stomach and intestine to the abdominal wall are capable of giving good results, even if theoretically objectionable in some regards. Duret of Lille first performed a gastropexy, but the operation has been considerably elaborated by others, notably by Rovsing of Copenhagen. The operation is not difficult, and can be performed on patients desperately emaciated. Bsides the sex difference, the aged suffer more on account of their previous bad habits in youth and middle life. Even new-born infants, however, may be victims of the condition. All these points are amplified in the paper. Usually the first treatment required for splanchnoptosis is six weeks' rest in bed, the foot of which is raised twelve or more inches according to the case. Forced feeding and proper bandaging with intervals of rest follow this measure. Kreider describes the operation of gastropexy, and reports four cases thus operated on and relieved.

Phlegmonous Gastritis. F. I. SHATARA, *Journal American Medical Association,* December 28, 1918.

A case of phlegmonous gastritis ending fatally is reported because of its rarity, only 100 cases having been reported so far. The submucous coat of the stomach is oftenest affected. It is usually secondary, occurring in the course of some other disease. There are two types, the diffuse and circumscribed have been described. The etiology is not definitely known, but a bacterial origin is most probable, and streptococci are the organisms most commonly found. In the case reported, streptococci were demonstrated by the Gram-Weigert test. In secondary cases the disease is probably carried by the blood stream. Symmers failed to produce the disease in animals by feeding ground glass, and inoculating streptococci and pneumococci. While its relation to gastic ulcer and cancer is unknown, the pyloric region seems to be the site of choice, though the entire stomach may be involved. The onset is sudden with pain and great disturbance, and the issue is rapidly fatal in from one to seven days. The diagnosis during life is, at best, a guess, though Chovstek is said to have made one such diagnosis.

The Treatment of Gastric Ulcer by Gastroenterostomy. C. H. MAYO, *Minnesota Medicine,* January, 1919.

The best type of gastric cases for surgery is that in which every method of medical treatment has failed, or the patients have become tired of the rigid diet and care which is necessary to relieve or to prevent relapse. Such patients greatly appreciate the relief obtained through gastroenterostomy and the ability to return to work with the diet that can be obtained by them in their station and environment.

Ceasarian Section Under Local Anesthesia. W.M.BROWN, *Journal of Obstetrics,* December, 1918.

We are now in a position to say that, in certain types of cases, abdominal delivery, under a local anesthetic, offers the safest means of terminating pregnancy, Brown believes, and that this method is entitled to a definite and permanent place in our records of progress. This procedure is indicated in whom, by reason of some concurrent or intercurrent disease, a general anesthetic is contraindicated and for whom a diifficult labor is unsafe. He divides these cases into three groups: I—Patients with advanced cardiac disease, in whom there is actual or impending muscle relaxation. II—Patients suffering from severe toxemia, hepatic and renal insufficiency, and impending eclampsia. III—Patients suffering from active pulmonary tuberculosis. Histories are cited to illustrate these three groups. Two important elements are necessary for success: I—Secure the confidence and cooperation of the patient. II—Thorough infiltration of the operative area and delicacy of manipulation of the exposed tissues and organs involved in the operation—the principal pain resulting from dragging upon, and manipulation of, the uterus and intestines.

Does Surgery Ever Cure a Case of Cancer? A. TATE, *American Journal of Obstetrics,* December, 1918.

Tate believes a complete eradication of the disease is questionable in most cases. But it is the duty of the physician, unless there be evident metastases, and if the patient can stand the operation, to operate without delay, even if there be only temporary improvement. One case is cited by him to show how after an early and complete operation two years ago, the patient is now a well woman; another case with abdominal metastrases had a tumor of 8 lbs. plus weight removed from the right ovary, is now in perfect health after three years; while a third case after complete removal of the uterus, ovaries, and tubes, but no removal of the growth which was in the right broad ligament. After extensive *x*-ray treatments has resulted in a probable cure. All of the above were proven inalgenont microscopically. But he believes that a hopeless case where there is no chance for even the prolongation of life, should never be subjected to surgery.

Forceps Rotation of the Head in Persistent Occipito-posterior Positions. A. H. BILL, *American Journal of Obstretrics, etc.*, December, 1918.

Bill uses a modified Scanzoni moneuver. The following are the steps:

I—An absolute diagnosis of position.

II—A true cephalic application of the forceps.

III—Rotation without any traction whatever; the extent depending upon the position.

IV—The sweep of the handles of the forceps through a large circle, after raising them first to favor flexion.

V—Fraction to fix the head in its new position.

VI—The application of the posterior blade first in the second application of the forceps.

The time at which forceps should be applied varies in different cases, but as a rule, there should be no interference with the first stage of labor, and a reasonable time allowed for spontaneous rotation.

The Advantages of Rectal Over Vaginal Examinations During Labor. R. A. BARTHOLOMEW, *American Journal of Obstetrics, etc.*, October, 1918.

Bartholomew believes that, while rectal examination cannot entirely replace vaginal examination, in ordinary practice it suffices in 19 out of 20 cases because of the adaptability of it to the anatomy of the parts. It also removes the necessity for repeated sterilization, and removes any danger of infection. The accuracy of rectal diagnosis during labor, after several trials, is sufficient in normal cases to be of value. The cervix is usually felt as a thick rim, which disagrees with effacement of the cervix. The presentery part can there be felt. Several pitfalls are mentioned and their diagnosis given. He considers rectal examination particularly useful when tests of labor are given to a patient before a Ceasarian or pubiotomy because of lessened dangers of infections and membrane rupture. Finally, he advises all men doing obstetrical work to familiarize themselves with this method, and then check themselves up by vaginal examination so that he will be benefited by the ease, accuracy, time-saving ability and safety that this method gives.

Conservative and Radical Methods of Treatment in Obstetrics. AUSTIN FLINT, *American Journal of Obstetrics, etc.*, November, 1918.

That the pendulum is beginning to swing back towards conservative methods of treatment is Flint's belief. Articles increasing the restrictions imposed upon radical methods are becoming more frequent. The Ceasarian section is being done far too frequently and on much too slight or relative an indication—the fact that "once a Ceasarian, always a Ceasarian" is true is being lost sight of, and because of some trivial condition, a section is done. Increased conservatism should also be practiced, he believes, in the treatment of eclompsea, especially as regards operative delivery. The conservative treatment includes early diagnosis by frequent laboratory and clinical observations with immediate institution of the eliminative treatment—if no prompt and absolute disappearance of all symptoms occurs, the pregnancy should be terminated. After the occurrence of convulsions, he believes that a moderately conservative treatment is best, because he believes that the sooner a uterus is emptied, the sooner a patient begins to improve. The Straganoff method of large doses of morphine, and doing nothing to hasten the delivery, he regards as one of the great advances in modern treatment, but he considers morphine dangerous, unless given merely to control the convulsions. Expectant treatment if unfruitful should be followed by bag introduction. There should be no other operative measures used—version and breech extraction, pomeroy bags, manual delatation, forceps, cranestomy, or vaginal or Ceasarian section, especially forcible delivery through an unprepared canal. This he claims is due to the fact that an eclamptic is a poor surgical risk. The usual eliminative and drug therapy is indicated before the induction of labor and following it—fluids, colon irrigations, hot packs, morphine, stomach lavage, and induction of free perspiration. The least harmful operation and most often performed is a simple low forceps. Breech and transverse presentations have to be extracted by version and breech extraction. But all manipulations should be restricted as much as possible. Of 14,000 deliveries at the Manhattan Maternity Hospital, 91 or 1 in 154 were eclamptic cases. Tables are given to show the relative mortality of the conservative and radical methods of treatment. The conservative method had a material mortality of 15.1% and a fetal mortality of 33.3%, while the radical operative treatment had a material mortality of 29.2%, almost twice as large, and a fetal mortality of 73.1%, more than twice as large. These figures he considers sufficient to impress the value of the conservative method. In addition, uterine rupture, seven laceration and other complications were observed in the radically treated cases. He especially emphasizes the fact that a large proportion of eclamptic cases can be prevented by an earlier recognition of the toxic condition, and valuable lives saved thereby.

Pathologic Conditions of the Pelvic Viscera, the Result of Induced Abortion Causing Sterilization, Disclosed by Abdominal Section. F. REDER, *American Journal of Obstetrics, etc.*, December, 1918.

Reder had a series of eight cases, who had a grand total of 56 induced abortions, all instrumentally produced after being preceded by certain medical treatment. The outstanding result of consequence was sterility, which Reder believes is more liable to follow instrumentation than medicinally induced abortions. After two to three years of treatment, which Reder believes should be the limit for local treatment, abdominal section was performed on each of them. A strange similarity of pathologic conditions was found in all cases.

Conservative corrections of these conditions were undertaken so that normal relations were obtained. As a result, two went to full term within 20 months, while the other six operated on within the last four years are still sterile. A definite prognosis as to certainty of pregnancy after exploratory abdominal sections cannot be given, therefore, Reder believes.

Accidental Removal of Intestines Through the Vaginal Vault. E. J. ILL, *American Journal of Obstetrics*, January, 1919.

In an effort to make clear what the possibilities are in the accidental removal of a portion of the intestines through the vaginal vault, Ill performed several experiments, and the following conclusions were drawn:

First: That any portion of the bowel can be pulled away by traction with a forceps through a rent in the uterus or vagina.

Second: That the point of separation will be the junction of the bowel with the mesentery.

Third: That in some subjects the separation will be extraperitoneal in a large measure.

Fourth: That the mesentery *cannot* be pulled away from its origin of the spine or elsewhere.

Recognition and Management of Labor Injuries. A. J. SKEEL, *American Journal of Obstetrics, etc.*, January, 1919.

Skeel believes that too much emphasis has been laid on the danger of post-partum examinations, which are really essential for good end results in labor injuries. But he believes that limiting or entirely avoiding vaginal examinations during labor is an essential preliminary part of the technic of primary repair of labor injuries. Immediate inspection of the cervix with primary repair of its injuries should be undertaken. This reduces the risk of subinvolution and of uterine displacement to a minimum. The routine use of buried sutures in the perineum for the repair of second degree lacerations permits, he believes, accurate coaptation and restoration of the parts. Perineal lacerations are more easily repaired than is subpubic damage. Therefore, slow delivery and skill in directing the small diameters of the head through the vulvar ring should be sought. Forcing the head against the pubic arch produces more damage than it prevents.

The Pathology of Chronic Metritis and Chronic Subinvolution. O. H. SCHWARTZ, *American Journal of Obstetrics, January,* 1919.

In a beautifully illustrated and well-written article, Schwartz comes to the following conclusions:

1. In general his views coincide with those of Shaw, whose pathological classification, namely, chronic subinvolution, chronic metritis, and hypertrophy, is an ideal one, of which only a small percentage—12%—has an overlapping which concerns chiefly the first two.
2. Chronic subinvolution alone is by far the most frequent cause of enlarged uteri, causing hemorrhage, pain, or leucorrhea.
3. The thickness of the uterine wall is due, in order of importance, to an increase of the elastic tissue, edema and liquefaction of the connective tissue, and hypertrophy or enlargement of the individual cells.
4. Chronic metritis does exist as a true inflammatory condition; and is frequently responsible for the symptoms in these enlarged uteri.
5. Chronic metritis, locally, is never primary; it is secondary to chronic endometritis, chronic salpingitis, or chronic inflammation within the pelvis.
6. Chronic subinvolution and chronic metritis may coexist in the same uterus.
7. Hypertrophy of the uterus has a pathologic basis of its own; it may occur in both multiparous and nulliparous uteri.
8. Chronic pelvic inflammation is seen occasionally only in connection with chronic subinvolution; and, therefore, other factors must play a greater rôle in the production of this condition.
9. The thickness of the wall in the majority of cases of chronic metritis and chronic subinvolution is due, partially, to the increase of the musculature.
10. The term "chronic metritis," used clinically, should be abolished; the term chronic subinvolution might be substituted in cases of multiparous uteri which are definitely enlarged and cause symptoms without evidences of pelvic inflammation—this would probably include over 80% of uteri which, pathologically, show signs of chronic subinvolution. The term chronic metritis might be applied in those cases in which there is evidence of pelvic inflammation, in connection with a more or less immovable uterus —this would embrace a greater portion of true chronic metritis, as well as those in which there is a distinct overlapping of both conditions.

Fractures of the Spine. NORMAN SHARPE, *Journal American Medical Association,* October 26, 1918.

Fracture of the spinal column with and without injury to the cord is the subject of Sharpe. When a fracture of the spine occurs, he says, we ordinarily think of it in terms of cord symptoms. There are, however, a large number (estimated at one third of all cases by Pearce Bailey) in which the cord and roots escape damage. Unless careful study is made of these cases the diagnosis is apt to be "simple sprain or contusion." Sharpe has recently reported a case in the *American Journal of Medical Sciences* of fracture of the second cervical vertebra without injury to the cord. Since that report he has seen five other cases in some of which it was difficult to see how the cord could have escaped injury. In four of the cases the vertebral body was fractured, and in two of them almost completely crushed. Yet the patients were able to stand and move after the accident, showing that crushing of the veretebral body, like removal of the laminae or posterior arches, does not completely disable, the main support being the articulation on the transverse processes. It is rare in fracture by indirect force to injure the cord except by hemorrhage, while the most severe injuries to the cord are seen in the common fracture-dislocations of one or more vertebrae. As was pointed out in the former article, however, complete abolition of function below the lesion in a spinal fracture does not prove that the cord is completely crushed or even damaged beyond repair. Sharpe gives an account of a case where an early laminectomy would have greatly benefited the patient, though the delayed one helped him. The only reliable sign that proves a complete crush of the cord, and the only contraindication to early operation, is a bony deformity so great as to show complete obliteration of the spinal canal. By early operation is meant a laminectomy after the patient has rallied from the initial shock of the injury, and this is possible only when the patient's condition is suitable. In many fractures of the spinal column without cord signs, the fracture has been entirely overlooked. If other injuries are present this is more apt to occur. Careful examination is necessary, for if the patient is able to move, sudden movement or twisting in bed may induce injury to the cord with serious symptoms. The treatment of fractures without cord symptoms is immobilization. If the fracture is high in the cervical region an extension should be made from the collar about the forehead, if in the lower cervical region an extension should also include the upper chunk. After from six to ten weeks, when all pain and tenderness have gone, the plaster may be followed by a stiff leather collar giving greater freedom of movement. If the fracture is in the laminae of the dorsal or lumbar vertebrae, a moulded splint of plater on each side of the spinal column and connected by transverse bands above and below the lesion will be found a satisfactory way of immobilizing the fracture and preserving the normal outline of the spinal processes. Fracture of the veretebral body is best treated by overextension on the Bradford frame. The author's five last cases are reported.

Wounds of the Spine. HAROLD NEUHOF, *Journal American Medical Association,* January 4, 1919.

Neuhof discusses a class of gunshot spinal wounds in which the dura is intact and the paralysis is caused by commotion or concussion or both combined. In the fatal cases a diffuse or a focal necrosis of the affected portion of the cord with a varying degree of edema is found, sometimes destroying all the cord elements at the same level though most frequently some portions remain intact. The presumption is that in cases in which recovery either total or partial occurs, edema was the cause of paralysis. In injuries by shell fragments the chances of recovery are the slightest if the wound is deep seated in addition to the functional lesion. There may be fragments of bone or clot directly compromising the dura, the removal of which is indicated chiefly, however, for reason of infection of the wound. Four cases are reported of this class. The spinal column was fractured in three of them while there was no demonstrable bone injury in the fourth case and in none of them was there any appearance of pressure on the dura and in none of them was it opened. The article is written to call attention to such cases.

Dislocation of Atlas. HAROLD SWANBERG, *Journal American Medical Association,* January 11, 1919.

Swanberg reports a case of anterior dislocation of the atlas following tonsillectomy. The night after the operation the patient's neck became stiff, and continued that way with headache that did not improve. Roentgen examination revealed the condition, six months after it first occurred. It seems impossible that the diagnosis should not have been made before. However, this is the second case of anterior dislocation of the atlas observed by Swanberg, which was not diagnosed by the roetgenogram at first. He thinks the history of the case must be defective, as there is no account of traumatism other than the operation which was performed under local anesthesia, and the symptoms of dislocation did not appear until the night following. The soldier declined further manipulation or operation, and suspension under anesthetic gave only temporary increase of motility, and the roentgenogram showed no change afterward.

Tarsal Torsion in Weight Bearing. WILLIAM JACKSON MERRILL, *Journal of Orthopedic Surgery,* January, 1919.

The writer points out that static pains localized in various parts of the foot, have been relieved when torsion of the tarsus and antitarsus was employed. This emphasizes the action of torsion stress and its correction by producing reverse movements to the discursions in the various segments of the foot.

Empyema. A. E. MOZINGO, *Journal American Medical Association*, December 21, 1918.

The surgical treatment of empyema by a closed method is described. The chief features of the method are summed up as follows: "1. A single early, minor operation without danger of shock or collapse of the lung. 2. Intermittent removal of secretion and antiseptic treatment given through a small rubber tube, wtih a bulb syringe. 3. Rapid partial sterilization with neutral solution of chlorinated soda (Dakin solution), followed by complete sterilization with a 2 per cent. dilution of liquor formaldehyd in glycerin. 4. Maintenance of negative pressure in the empyemic cavity, tending to early obliteration of the cavity. 5. One dressing which will last several days and no skin irritation. 6. Emphasis on simple physical principles rather than on major operative surgery." Details of the method are given at length and several cases are reported as treated by this closed method. A total of thirty-two cases were treated, twenty-six of whom, or 81 per cent., having completely recovered. A number of them were of long standing. The complications which have been observed included communication between the cavity and a bronchus which Mozingo thinks is more frequent than is generally supposed. One patient developed spontaneous pneumothorax, and a brief history of this case is given. A comparison is made with other methods, and the following advantages claimed: Absence of shock and collapse of lung, perfect evacuation and cleansing of the cavity and absorption of toxins, prevention of fixation of the lung by compression and more rapid sterilization. Dakin's solution followed by 2 per cent. dilution of liquor formaldehyd and glycerin is the ideal antiseptic, and communication with the bronchus is not a contradindication to its use. Constant negative pressure gives the maximum expansion of the lung, and the irritating and antiseptic action of the sodium hypochlorite solution causes rapid obliteration of the cavity. In uncomplicated empyema the patient need not be kept in bed. Test smears are negative when cultures are positive if Dakin's solution is used, and vice versa when formaldehyd-glycerin is employed. Roentgenographic and bacteriologic facilities, while always preferable, are not absolutely essential with the closed method, which is also attended with great economy of time, labor and dressings. It can effect cures in many cases similar to those originally treated by the Schede, Eastlander or Delorme operation. It is practicable at the home and in country practice. Hypochlorite solution of increased strength over Dakin's solution in both alkalinity and amount of vailable chlorin can be safely used in empyemic cavities, or Labarraquo's solution, diluted to the strength indicated, can be substituted for Dakin's solution. The closed method offers good chances of effecting cures in cases of double empyema through the possibility of treating cavities on both sides at the same time, which treatment is impossible by the open method.

Further Observations on the Radical Treatment of Peritonsillar Abscess. CLEMENT F. THEISSEN, *Annals of Otology, Rhinology and Laryngology*, June, 1918.

Reports thirty-six cases of peritonsillar abscess in addition to forty-four reported in 1916 in which the abscess cavity was opened and drained by dissection backward toward the capsule with either partial or complete removal of the tonsil.

The operation can be performed in selected cases—where the surrounding edema is not so geat as to limit the opening of the mouth. Pus is present very early in the disease. Failure to find it is due to the incision not being deep enough toward the capsule. Theissen operates early, preferably during the first three days. The tonsil is dissected backward until pus is found. Then the portion of the tonsil that has been dissected free is removed. This technic was followed in the first twenty cases. In the later cases of the series reported (16) he followed Barnes' suggestion and removed the entire tonsil. He believes, with Barnes, that no untoward results follow. In his cases they were most gratifying. Local anesthesia—cocaine and adrenalin—was employed except in five cases—in children when the anesthetic was ethyl chlorid.

Surgery of Arteries. F. C. HERRICK, *Journal American Medical Association*, December 28, 1918.

Herrick shows the disadvantages of introducing foreign bodies in the surgery of large arteries and aneurysms. Protocols of his experiments are given and a fuller report is promised for later publication. The summary and conclusions as to the work so far carried out is thus given: "1. Strips of rectus fascia with muscle attached of varying size up to three-fourths that of the aorta of dogs may be placed through a dog's aorta or carotid without causing permanent clot or thrombosis. In certain cases no clot at all is formed. 2. In over half the experiments, the contraction of the aortic walls about the inserts and of the inserts against the slits in the aorta entirely controlled hemorrhage. In the remaining cases, from one to four simple sutures controlled bleeding from the corners. 3. These inserts diminished the lumens of the aortas to approximately one-third to three-fourths their former volume. 4. Such inserts may be used to diminish the volume of a large artery, to diminish the orifice of a sacculated aneurysm, to favor thrombosis of the aneurysmal sac by being placed through it, or to limit the size of a fusiform aneurysm by being placed so as to exclude certain sectors from the current. 5. In no cases have symptoms of embolism been noted. The only pathologic observations to exclude such occurrence were: (a) In two cases examined at necropsy within six days, no clot was formed at all. (b) In four cases examined at necropsy later than six days, no clot was present. (c) In all cases but one, when a clot was formed it took a uniform, blunt tipped icicle shape, was quite firm, and would not easily break off. 6. A patch of fascia or muscle may be sutured to an arterial defect with perfect functional results. 7. The sac of an aneurysm or the vessel proximal to it may be lessened in volume by such inserts. 8. An arterial patch of muscle and fascia in a dog is consistent with perfect function of the artery."

Clinical Results in 200 Transfusions of Citrated Blood. R. LEWISOHN, New York, *American Journal of Medical Sciences*, February, 1919.

Lewisohn believes that the method of adding an anticoagulin to the whole blood for purposes of transfusion has come to stay, and that thus far his citrate method has proven to be the most applicable. Lewisohn's analysis of the results attained in 200 cases proves its eminent usefulness. Chills do not occur any oftener by the citrate than by any other method of transfusion, and the reasons for the occurrence of these chills are not quite clear.

Anthrax Septicemia From Accidental Inoculation of Shaving Wound. R. W. AUGENNIE, Rochester, *Boston Medical and Surgical Journal*, Feb. 6, 1919.

Augennie reports the case of a robust young man aged 24 who developed what appeared to be an ordinary furuncle of the left cheek. He told the story of having shaved himself that morning and of accidentally cutting himself. A new brush had been used. All the symptoms of a virulent anthrax developed and he died in four days. Augennie quotes the United States health report to the effect that anthrax of the face and neck after shaving has been noted increasingly often of late. It is assumed that this increased incidence is perhaps due to the letting down of the bars due to the war against raw materials employed in the manufacture of shaving brushes.

Superficial Epitheliomas of the Skin. L. W. KETRON, *The Journal of Cutaneous Diseases*. January, 1919.

Basal-cell epitheliomas may occur as superficial patches with little tendency to invade the deep layers of the corium. The only clinical sign which distinguished these is a raised pearly border; but this may be absent, and the differentiation is only possible on microscopical examination.